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THE USES OF NEWER MEDIA IN ART EDUCATION PROJECT.
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*ART EDUCATION, *MEDIA SPECIALISTS, *SYMPOSIA, *TEACHER SEMINARS, CONSULTANTS, *MEDIA RESEARCH, TEACHING MACHINES, DISTRICT OF COLUMBIA

THE IMPACT OF EDUCATIONAL TECHNOLOGY ON ART INSTRUCTION WAS STUDIED DURING A 5-DAY SYMPOSIUM. THE PARTICIPANTS WERE 50 ART EDUCATORS AND 4 MEDIA SPECIALISTS. HUMAN LEARNING AND DEVELOPMENT, RESEARCH IN THE MEDIA FIELD RELEVANT TO ART EDUCATION, MEDIA HARDWARE, AND PROJECTION OF PRESENT MEDIA TENDENCIES WERE EXPLORED AND EXAMINED THROUGH PAPERS, PANEL DISCUSSIONS, SEMINARS, GROUP ANALYSIS, AND SIMILAR APPROACHES. BASED ON TEACHING LEVEL, SEMINAR GROUPS WERE FORMED OF (1) ELEMENTARY AND SECONDARY TEACHERS, (2) SUPERVISORS, (3) ART EDUCATORS IN HIGHER EDUCATION, AND (4) ART EDUCATORS REPRESENTING RESEARCH INTEREST. DISSEMINATION ACTIVITIES INCLUDED A MULTIMEDIA (SLIDE-FILM-TALK) PRESENTATION AND PUBLICATIONS. SYMPOSIUM PAPERS, SYMPOSIUM DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS ARE REPORTED. DISCUSSION TOPICS INCLUDED (1) TECHNOLOGY AND ART EDUCATION, (2) IMPACT OF THE MACHINE, (3) INTERDISCIPLINARY APPROACHES, (4) CONDITIONS FOR THE USE OF MEDIA, (5) CHANGES IN ART EDUCATION RELEVANT TO MEDIA, AND (6) PRACTICAL PROBLEMS IN THE USE OF MEDIA. (RS)

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Vincent Lanier, Project Director

final report of the uses of newer media in art education project

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Published August 1966 by the
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This version of the Mona Lisa (detail, inside covers) was produced as a digital plot by H. Philip Peterson with a scanner and two computers developed by Control Data Corporation, and a plotter made by California Computer Projects. Mr. Peterson is with Control Data Corporation, Digigraphic Laboratories, Burlington, Massachusetts. It is composed of small cells containing "two decimal digits reporting the density at a point on a color projection slide copy of the painting." Reprinted with permission from "Computers and Automation," December, 1965, copyright 1965 and published by Berkeley Enterprises, Inc., 815 Washington Street, Newtonville, Massachusetts 02160.

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Vincent Lanier, Project Director

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Description of the Project:

DESCRIPTION OF THE PROJECT

Vincent Lanier, Project Director

Like every other professional in education and most of the literate public, teachers of art and art education have been watching the recent consistent progress of instructional technology. As the media field becomes more widespread and more inventive, some of its implications for art education become obvious and exciting. Late in 1964 a group of art educators developed the concept of a project designed essentially to collect information on the newer media and their impact on the teaching of art and to disseminate this information as widely as possible among the members of the profession.

To some extent the origin and intent of this project paralleled the music educators project of that year.[1] Also, since NAEA is capable of widespread and effective dissemination, the project, like that of the music educators, was developed as a proposal to the USOE, sponsored by the national association.

The proposal was submitted to the U. S. Office of Education in March, 1965. It was approved by the Arts and Humanities Branch and the Media Office of that agency and funded under Title VII B of the National Defense Education Act for $66,044.00. Its duration was 18 months, starting May 1, 1965 and ending August 31, 1966. A committee made up of Edward Mattil (Pennsylvania State University), Herbert Burgart (George Peabody College), Kenneth Beittel (Pennsylvania State University), Charles Dorn (NAEA), Elliot Eisner (Stanford University), Harlan Hoffa (U.S. Office of Education), Anna Hyer (Division of Audio-Visual Instruction), C. R. Carpenter (Pennsylvania State University), Gerald Torkelson (University of Washington) and the Project Director assumed the responsibility of planning the overall framework of the project.

Since the project was concerned with the generation and accumulation of media ideas and information as these relate to the teaching of art, the focus of the project was seen as a symposium of 5 days length during which 50 selected art educators and 4 media specialists would be brought together. By using dependable traditional devices such as the presentation of papers, discussion by a carefully chosen panel, intensive analysis of particular problems by small interest groups and the examination of a range of existing media hardware and materials in art, the symposium could and did concentrate sustained attention on the impact of educational technology on the field in question.

Subsequent project activities were seen primarily as supportive of the widest possible dissemination of ideas and information from the results of the symposium and all other relevant sources. This dissemination included visual and verbal presentations at the NAEA regional conventions and other meetings, and duplicated and printed materials developed by the project and published by NAEA. This project report itself is visualized as a dissemination vehicle.

In order to insure the greatest likelihood of a wide dissemination of the results of the symposium, a broad range of levels of art education was stipulated for participant selection. The 50 funded participants included elemenatry classroom teachers, secondary art teachers, supervisors of art, college and university art and art education teachers, researchers, and those interested in continuing education and museum education. Also, in each case, the individual participant's capacity for serving as a disseminator was emphasized, both in the selection process and in his subsequent activities during and after the symposium. Four media specialists (Carpenter, Allen, Finn, Norberg) were chosen as people who would be able to reflect some sensitivity for the educational role of the visual arts as well as superior competence and imagination within the media field.

The kinds of issues confronted by those assembled at the symposium included a considerable variety. One type was the exploration of human learning and development and the reciprocal impact of such investigation on both fields. While art education is poorly (and some might say properly so) represented in the structures of theories of learning and instruction, educational technology is very heavily indebted to these areas for conceptual support. The review of the implications of the intellectual origins of the media field was done by C. R. Carpenter in the first paper.

A second area of concern was the growing mass of research in the media field and its relevance to art education. In particular those studies which investigated visual phenomena can, and in some instances do, provide material with which the art educator can more readily understand the dynamics of his own field. A further consideration in this area is the possibility that research in art education can shed some light on the problems which media students face both on a theoretical and on a practical level. While this was not found to be the case during this project, by no means have all potential relationships of this nature been fully explored. William Allen presented a paper on this second issue.

A third kind of issue was examined by James Finn. This had to do with the existing hardware of media, its proper logistical and administrative handling, and how both these factors can exert influence on the teaching of art. Although those in educational technology are quick and correct to point out that the machine aspect of the field is not its only present or potential contribution, there is no doubt that much of the significance of the field for art education, or for any curriculum area, is dependent upon a proper exploitation of technological developments. For this purpose, the kind of stimulus which can grow out of exchanges of information during a prolonged confrontation is of great and unique value. Often the benefits derived from the experience for later speculation and development cannot be readily observed at the close of the period of confrontation, or, for that matter, may never be recognized as the source of a subsequent step forward. James Finn's presentation at the project symposium is omitted in this report due to its essentially visual nature. His approach to media problems, however, is well represented in the panel discussion portion of this document.

The last speaker, Kenneth Norberg, was given the task of projecting present tendencies in media as they relate to art education in the near as well as distant future. In some instances, the most imaginative extrapolation may provoke the most practical consequences. This is perhaps most true in relating areas of consideration which have up to that point been reasonably discrete.

Building upon the conceptual and informational bases established by the media specialists in their prepared papers, the panel discussion, in which media and art education people could develop a spontaneous dialogue, extended the intensive analysis of problems and issues. Here, the art educator had a structured opportunity to tap the rich storehouse of knowledge each of the media specialists brought to the symposium and to explore each point with considerable thoroughness. The panel discussion, including comments and questions from the audience, is presented almost in its entirety in this report. It is interesting to note that challenging and insightful questions came from the media people to the art educators as well as in the opposite direction, as had been anticipated. While it is undoubtedly gratifying to witness the high level of interest and awareness of those outside the field in the problems of art education, one might wish that the profession had a greater body of sophisticated theory and reliable findings with which to answer those questions. Some solace can be derived from the fact that both thoughtful analysis and empirical investigation are new to the history of art education as compared to most other disciplines. Nevertheless, the questions of an alert and critical outsider can dispel any tendencies towards complacency, a result fortunately most conducive to further thought and action.

Following the transcript of the panel discussion are the reports of the four group seminars. These groups, formed on the basis of teaching level, were composed of (1) elementary and secondary teachers; (2) supervisors; (3) art educators in higher education; and (4) art educators representing research interests. The reports were developed as a distillation of from four to seven hours of group discussion, during which time the knowledge and stimulus absorbed from the presented papers, the panel and the exposure to films, media devices, and media materials such as slides, filmstrips, and paperback books could be filtered through teaching level and individual situation requirements. The lack of a commonality of format among the reports should indicate the relative restraint of this symposium on the matter of structuring of approach. Though a certain rigidity of structure in such group situations usually promotes efficiency, it may also inhibit the latitude of ideas surveyed and may deny easy access to unusual ideas.

The final symposium document represented in this report is the evaluation summary written and presented at the meeting by the project evaluator. In it the evaluator reviews the content and procedure of the symposium with respect to an assessment of their effectiveness. The last section of this report attempts to bring together the major problems in the uses of newer media by art education and some recommendations as to future activities which may expand and refine these uses. While a substantial portion of the ideas in this last section stem directly from the materials accumulated during the symposium, some ideas reflect other aspects of project activity. Also, it must be noted that this section ultimately represents the summation of one person, the author. Needless to say, every effort has been made to provide a thorough and impartial abstract of the ideas and information brought to light during the lifetime of the project. Nonetheless, some degree of judgment must of necessity be exercised in such a task, if only in providing greater emphasis to some issues over others.

A few details of the project symposium which do not appear elsewhere in this report might be worthy of presentation here. The symposium was held during the week of December 13-17, 1965 in the National Education Association Center in Washington, D.C. The 50 participants were made up of 15 classroom teachers, 15 supervisors, 10 college teachers and 10 researchers. They were selected from among 201 applicants according to criteria such as geographical location, teaching level, media background and dissemination capability. There were also 56 observers in attendance, 19 of them present all 5 days. During the symposium, 53 films and one videotape were screened; 21 pieces of media equipment were exhibited; and 38 filmstrips and a number of slides, tapes, discs, paperback books, reproductions, programmed learning sequences, 8mm loop films, transparencies and museum exhibits were displayed. The program provided 11 hours of taped lecture and discussion, in addition to the many hours of unrecorded committee discussions.

Although none of the many dissemination activities of the project are shown in this report, they should, at least, be described here since the primary concern of the legislation under which the project was funded is dissemination of media information. The dissemination procedure with the greatest impact was probably the multi-media (slide-film-talk) presentation given by the Project Director and appearing as part of the program of each of the four NAEA Regional Conventions.[2] As part of that presentation, photographs and motion picture film taken at the symposium, along with slides donated by the exhibitors, were put together into a five-minute film by Robert Beeching. This film was reduced to 8mm and cartridged without charge by Technicolor. A rough estimate of the number of people who saw the presentation both at the four regional meetings and at other conferences where it was given would be between 500 and 600. The cartridged film on standard 8mm is now available through the NAEA.

The next substantial attempt at dissemination was the April 1966 issue of the official

NAEA Journal, *Art Education,* which was devoted to newer media and featured nine illustrated articles on facets of the project and its subject. A further step, designed to provide a basic pool of information on available media resources for the profession, was the project's development for publication by NAEA of the following documents:

1) *Films on Art* (compiled by Alfred Humphrys and expanded by the project), published December 1965.

2) *Slides and Filmstrips on Art* (including 8mm loop films and transparencies), in press.

3) *Printed Materials on Art* (including reproductions and paperback books), in press.

Whatever one's personal opinion may be with respect to the desirability of using newer media in the teaching of art, it would be difficult to deny that this profession, along with all of education, appears to be moving increasingly in that direction. There are those who regret this development and their concerns and integrity must be respected if we are to maintain the intellectual dignity and freedom we prize so highly. On the other hand, it would appear that a considerable majority of art educators welcome the newer media as tools which, when used judiciously, can improve the teaching of art. In this sense the project can be viewed as an attempt by the national association and the federal government to help art education to turn one of the several corners it needs and now wants to turn.

NOTES

1. National Conference on the Uses of Educational Media in the Teaching of Music, sponsored by MENC and USOE, December 7-11, 1964.
2. Dates and places of these meetings were: Eastern Regional, Boston, March 16-19; Western Regional, Houston, April 2-7; Pacific Regional, Asilomar, California, April 3-6; Southeastern Regional, Tallahassee, April 24-27.

Symposium Papers:

THE NEWER MEDIA AND EDUCATION IN THE ARTS

C. R. Carpenter, Pennsylvania State University

The time and place are most favorable for this symposium on the *Uses of Newer Media in Art Education.* At this time especially there is a rapidly growing interest and much activity in all of the different forms and varieties of the arts. Yearly, increasing thousands of people, professionals, amateurs, and just common people, actively begin to participate in some form of the graphic and fine arts. The number of people, whether they are producers or consumers, creators or appreciators, escalates yearly, perhaps in an increasing ratio to population growth. This place is also propitious for our planned discourses on media, methods, potentials, and possibilities for education in the arts. Here there exists the new National Arts and Humanities Foundation established at long last to counterbalance the National Science Foundation. Here, too, exist sources of federal leadership, support, and encouragement for creative new developments in the arts, developments far greater in scope and purpose than we would have dared imagine prior to the formulation of the doctrine of the New Frontier and the Great Society. This is a good time and place for our deliberations and discussions.

The main task

The task before us is formidable and exceedingly complex. We probably have a sense of helping to launch new enterprises for education in the arts. Although old and with deep roots in human biological origins and human history, these aspects of education, nevertheless, have much that is newly emerging. Similarly, the "newer" media of communication and of instruction are at the dawn of their development. Most media, whether they essentially involve films, tapes, or electronic waves, are in that stage when their novelty is attractive to some people but repellent to others. New or old, art forms or processes and the media are ubiquitous in contemporary society. Whether we speak from the viewpoints of the arts or of the media relative to education, learning, and training, much of our insecurity and uncertainty derive from our recent arrivals wherever we are.

I judge that the main task of this symposium is to explore as deeply and as systematically as possible the useful potentialities and possibilities of the "newer" media or serving, advancing, and improving the efforts of those who teach and of those who learn in the arts. If this be the main objective of the conference, then I would suggest that all explorations involve risks of failure and that complete success is rare. We may expect some successes and more failures in our attempts to see the potential and possible fits and adaptations of the newer media and learning to the skills of artists, or of the activities of anyone involved in artistic or aesthetic behavior.

The task before us, as I understand that task, is not to resolve the conceptual and role conflicts between different people or groups of people in the broad field of education for the arts. Let us think about and speak to a broad and diverse audience: those who train young children to see colors, forms, perspectives; those who teach teachers how to teach artistic literacy to increasing millions of young students; those who train the talented elite to the highest levels of excellence in artistic performances; or those who communicate with and through both the media of the arts and the "newer" media of communication, and seek to raise the levels of taste in the arts of vast adult populations.

Let us not, as we proceed to explore the reciprocal interactions between the training in the arts, draw boundary lines between the producers and consumers, the senders and the receivers, the processes of creating or producing and the processes of perceiving, analyzing, criticizing, and understanding. *Let us not divide that which is best left whole, or analyze that which most needs synthesis and integration.*

Some objectives of education in art

If I read correctly what educators in the arts and related fields have written, the many purposes of instruction, training, and learning are represented by the following:

To learn to perceive;

To learn to discriminate in terms of appropriate value scales and judgements among artistic performances and products;

To learn different kinds of aesthetic performances with different materials and art media;

To learn the skills of expression in selected forms, structures, and materials;

To guide individuals into levels of freedom of performance and personal integration which result from mastery of materials and techniques;

To instruct the artistically illiterate so as to increase the levels of aesthetic literacy;

To wage educational campaigns against ubiquitous ugliness in the appearance and behavior of people and in the environments which men both create and destroy;

To train the artistically talented elite toward the limits of excellence in specialized performances;

To provide reservoirs of art products and performances which can be appreciated and enjoyed by large numbers of deserving people.

It is perhaps presumptuous for me to attempt to state a set of objectives for educators in the arts or for art educators.[1] I do not expect these statements to be accepted. I have made these points as a consequence of some frustration I experienced after searching the literature and finding many conflicts and contradictions in what the objectives are or should be. Also, I have made these points to show the need for such statements before we can intelligently discuss the uses of "newer" media in art education. In fact, it would be desirable, and will eventually be necessary, to restate these objectives, making them more specific and phrasing them to require clearly defined and testable performances.

The purposes of this paper

The purposes which I hope to serve with this initial presentation are the following:

To begin to set the stage for following discussions by outlining general problems and propositions which relate to the interactions of education in the arts and the development and uses of the "newer" media;

To begin a series of definitions of areas, language, and processes which may later be of service in our discussions, here and elsewhere;

To begin to outline the possible roles and uses of the "newer" media as we strive to see these means for assisting art educators to accomplish their defined and accepted objectives.

Finally, I shall not hesitate from time to time to state unanswered questions or unsolved problems which need answering or solving, and which may interest educators in the arts as areas of reserach and development.

Areas of discourse

It seems that we are involving ourselves in three general areas of discourse: the behavioral sciences, art and aesthetic contingencies, and the "newer" media. Each of these fields is most complex and each lacks a common conceptualization, a common language, and a unity of purposes. The areas are not pure disciplines, for each can be reduced to more specific and perhaps fundamental areas or lines of study and scholarship. Since the areas of subject matter, of academic and professional efforts, of sciences and arts are pluralistic and are discussed in many languages, how are we to manage our efforts at interdisciplinary discourse so that it will be most stimulating and productive?

I propose, as a partial solution to this problem, to state two sets of generalizations, one deriving from the behavioral sciences and the other from the field of the media. The generalizations will not be on the same levels of abstraction or of the same scope. They will vary greatly in the degree to which evidence can be found to support them; hence, some may be classed as hypotheses, other are assumptions, and still others as propositions. All may be classed as theories of some variety or kind. Perhaps none of the statements can be called dependable conclusions. All of the statements have been selected, by means of a mysterious personal logic, from a wide range of alternatives. The generalizations that follow are time-, space-, and person-limited. Each deserves and, it is hoped, will provoke both discussion and disputation.

Some pertinent generalizations from the behavioral sciences

The human organism is the product of genetic determinants, adaptability of this organism, and organism-environment selectivity operating over much time;

The organic adaptability of the human organism is supplemented by the capacities for learning and the operation of vast networks of learning processes;

Genetic assortments and transmission of gene-determiners are paralleled by learning—the latter most specifically provides the mechanisms for cultural transmission;

Changes in the rate and patterns of genetic transmission from generation to generation are relatively slow compared with rate and pattern changes which are mediated by learning and the resulting culture;

A most conspicuous characteristic of evolved human behavior is that it acts on and modifies the environment, and thus brings environmental demands within the ranges of man's adaptive capabilities;

The human organism's exceptional capacities lie in those modalities of speech and communication;

Play is a universal modality of behavior in young mammals, and play and recreational behavior continue on a reduced basis throughout the life cycles of most humans.

In summary

Learning cultural differentiation and cultural transmission, language and communications, construction and destruction, play and recreational investments of surplus energies provide the organic behavioral *milieu* for the arts;

Different cultures and sub-cultures when isolated from each other always develop distinctive forms of communications, patterns, of actions on and interactions with the environment, and distinctive, more or less depending on degree and time of separation, forms of play and the expenditure of surplus energies.

Differences and similarities:

The *variabilities* of the organic, personal behavioral and cultural or group behavioral characteristics are among the most conspicuous features of man and his societies. Thusly viewed, that behavior which relates to art as *performance* or art as a *product* has a basis in those biosocial processes and forces (energizing mechanisms and ways of investing energies) which are fundamental to all human evolution and human activities. Hence, artistic activities may well be viewed as integral and essential and not as peripheral and nonessential components of human society. Artistic activities like scientific and technological activities surely have adaptive values for human populations.

Generally it seems to be agreed that the organic as well as the inorganic matter-energy systems operate *deterministically* and in ways described by probability mathematics. It remains to be learned whether the descriptive principles of aesthetics or the imaginatively creative variabilities of art are also subject to deterministic systems that are as compelling and limiting; or whether more freedom does and should prevail in this domain of the arts than in the sciences and technologies.

These generalizations are oriented to *phylogenetic* evolution. There can be another set of generalizations which are closer to the work of educators in the arts and which are oriented to the *ontogenetic* or individual development and life cycle. Let us observe the following possible examples:

Young children must both mature and learn the processes of perceiving, of using all the senses for discriminating colors, forms, objects, motion, persons as well as interactions and relationships.

The maturation schedule and the corresponding learning schedule or rates can be charted for an individual child, and norms can be statistically charted for populations of children in a relatively homogeneous culture or sub-culture.

It would appear to be a reasonable hypothesis that there are maturational stages when instruction is most appropriate and learning most productive; when these maturational stages are missed instructional efforts are ineffective, and learning is most difficult and stops short of the optimum levels of achievement for the individual child. For example, the capacity of young children for learning languages changes in accordance with this hypothesis.

The response to art objects, the appreciation or undertaking of the language of art, as well as performace of the skills of an art, are interdependent with the growth-maturational schedule of an individual.

The growth schedule of an individual includes both organic and sociocultural factors. For example, the aesthetically illiterate adult of thirty-five apparently has low possiblities of ever learning to appreciate nonobjective painting or the music of a modernistic symphony.

The individual's artistic behavior varies with maturational and growth factors. This behavior also varies with both general and special abilities, and the educator in the arts may urgently need to take into account the special artistic abilities of students.

Questions of importance in this connection are the following: What can and should be done to train the majority of people of a population who lack potentials for moderate or advanced levels of artistic performances and the perception, discrimination, understanding and appreciation of the arts? How can the artistic literacy of a whole people be raised?

I have attempted to formulate a few generalizations to illustrate a biosocial approach to providing a rational basis for artistic behavoir, and to propose that artistic behavoir is as basic and fundamental as are other modalities of behavior. These generalizations, although they are a low order of theory, may nevertheless provide some concepts for discussion and perhaps some guidelines for different kinds of instruction *in education for the arts.*

Audio-visual theory

No coherent audio-visual theory seems to have been derived from the behavioral sciences. There have been a few spurious attempts to formulate such theories. The basic, nontheoretical facts are that humans have sensory-perceptive capacities which permit responses to different kinds of energy changes such as heat, sound and light waves, contact, pressure and kinesthesis, and the chemical senses of taste and smell. The many senses of the human being, acting as separate modalities or in combination, depend on the characteristics of the stimulus situation; they provide possibilities and also limits to the ways the individual can react to his environment or to materials which are formed as arts.

In the context of these facts the roles and functions of the media of communication and instruction (I object to classing these as "audio-visual") are the following:

Examples:

1. To represent to the person in varying degrees of realism-to-abstractions, i.e., on the semantic continuum, stimulus materials for reactions, interactions, response, learning and transformation. Usually these representations are selected and organized for special effects and purposes.

2. To capture a stimulus situation and preserve it for repeated use.

3. To represent stimulus situations so as to bring visual and auditory phenomena to restructure them for emphasis, or indeed within sensory limits.

Viewed thusly, the media under consideration are plastic, pliable, and dynamic means of recording, selecting, organizing and presenting or displaying materials of many kinds and qualities. These acts can be done for many purposes. Media can be used to preserve and store information, to serve as carriers of information in diffusion or dissemination operations, to provide pleasing organizations and sequences of patterns of stimulation, or, finally, to provide *conditions believed to be favorable for learning.* This last function, especially, relates closely to the interest of the educator in the arts.

Media and modes of communications

In descriptions and discussions of communications and media it is useful to distinguish *modes* of stimulus materials from the media. The modes of communication lie closer to the form and structure of the information being conveyed. For example, in films the photographic or graphic modes may be used. The photographic mode may be further broken down into still or motion, and color or monochromatic. The medium could have been video tape rather than film. The modality of sound can be "encoded," stored, and transported by films or tapes; but while the sound records when activated may be of speech or music, the different *modes* of stimulation were carried by the *same medium*.

This analysis can be carried further. The elements of the modes of expression, stimulus, or communication could be described in terms of signs, signals, symbols, or even noise. Various linguistic or "information theory" analyses, also, could be used. Although interesting and important, these analyses are probably, at this time, not very helpful to the art educator.

Let us revert to a point: namely, that the media and modes of stimulus materials are means of arranging conditions favorable for learning. The pervasive and important behavioral phenomena of organic adaptation and individual learning are especially contingent, or even central, to all aspects of art education. We could wish that a finite number of theoretical propositions, "laws," or "principles" describing learning, could be stated and be useful to art educators. I have chosen to state a series of operational guidelines rather than present very abstract general theories.[2]

1. What is to be learned by whom and when are judgments that must be made in relation to the relevant characteristics of the learner(s)?

2. The broad condition of motivation is contingent to learning; however, motivational states are complex in kind and vary in degree. Motivation may be general, as with the achievement motive, or specific, as when a learner acts so as to have the approval of a respected person.

3. Reinforcement of both the positive and negative kinds operates, in specific ways relative to specific performances, to establish or extinguish learning activities of many kinds.

4. Rewards that are positive, favorable, pleasant, and encouraging are usually more effective as regulators of learning than rewards (or reinforcements) that are negative, unfavorable, and unpleasant. Success is more motivating than failure, although both results can influence the dynamics of human learning. The *personalist* factors need to be considered here. What does success and failure mean in terms of the image of the learner of himself, and what are the effects of achievement on social statuses?

5. Personalized instrinsic or internally symbolized rewards and reinforcements are preferable to external rewards, especially when the latter are inappropriate to the learner's accepted values and personal frame of reference.

6. Tolerances for failures and fitting reactions to success need to be learned, and an important element to control is the success-failure ratios, with successes greatly predominating over failures (perhaps 9 to 1).

7. The learner needs to set realistic goals for himself and to define feasible levels of achievement and performances.

8. The personal history of learners and their established (learned) attitudes towards teachers, peers, and others importantly and persistently influences what is learned and at what rate.

9. Active participation and responses of the right kind strengthen learning more than passive attitudes. Active and passive states should not be confused with covert and overt responses.

10. *Organized* and *meaningful* materials and tasks, those that are significant to the individual, are favorable and have positive

effects on complex learning.

11. Repetitive practice is necessary for many kinds of learning, but the amount of practice required varies with the tasks and learning objectives or criteria.

12. Learning performances, when assessed or evaluated as the performances occur, can be powerful sources of reinforcement for the learner. This is in the area of the cybernetics of learning.

13. Spaced or distributed practice and recall affect the retention of skills and information.

14. Differentiations and discriminations are learned to those degrees that they are functional and useful to the individual, and that they are reinforced by the cultural context.

15. The utility of learning may be increased by stimulus materials and instructional situations which simulate or are similar to stimulus situations which will operate on the learned performances.

16. Relevant previous learning, attitudes, and "expectations" are close contingencies to new learning.

17. In Gestalt terms, ground-figure differentiations or discriminations, and the needs to complete a composition or task, operate positively to sustain effortful learning.

These operational statements are simply one set of possible guides for arranging conditions for the acquisition of new concepts, language (symbols), skills, attitudes, and value norms. The statements are not closely integrated; they are drawn from the associationist, Gestalt, behavioristic, and conditioning perspectives of psychology. Marked revisions would occur were the statements to be made expressive of and consistent with "programming" doctrine.

Programmed instruction

The eventual net residues of programming prescriptions are likely to be the following:

1. The requirement to specific precisely the performance results that are expected and to validate these results constantly.

2. The application of procedures of reinforcing learning by providing information and "feedback" on successes, approximations, and failures or errors.

3. The use of "small" (or, better, optimum) steps in organizing the training procedures and of sequence the steps, units, and blocks of training in orders which lead to the required performances.

4. Programmed instruction will emphasize the importance of the *rate of presenting* new steps and units of instructional materials. Related to this is the need to consider the "concept load" of the instruction, the levels of difficulty of the materials relative to previously learned performances.

5. Finally, programming procedures, will provide for much needed testing of achievement as learning progresses, and for the validation of instruction or learning.

We can predict that the contributions of programmed instructional methods and techniques will eventually merge into the slowly growing body of knowledge about learning, its characteristics and requirements of control and management.

The prescriptions of programmed learning are not exhaustive; they do not describe all of the necessary conditions for all the kinds and levels of learning. Step and unit size, pacing, the kind of responses related to kinds of learning tasks, and kinds of reinforcement are all subareas that invite research and additional interpretations.

Earlier, when programmed learning appeared to be the great revolutionary discovery that would solve many educational problems, programmed materials and teaching machines were confused. It was an odd turn of history that the key publicists of the programming movement were not professionals in the media fields. Accordingly, there was a burst of efforts to invent, make, and sell teaching machines. The real functions of teaching machines were less analyzed than the features relating to marketing and buyer appeals. When it was realized that teaching machines functioned essentially to control the presentation of stimulus materials or "frames," to provide for pacing and sequencing, and to provide for reinforcement, then existing media like stripfilms with sound, loop films, sound motion pictures, audio and even video tapes could be adapted for a great range of training tasks employing some of the best features of programmed instruction. The barrier to the development, a development which involved the hybridization of programmed instruction and the "newer" media, was the assumed requirement that individuals learned best at their own rate. This is like saying that an individual's reading speed is the best rate. When modification of this requirement was shown to be acceptable, two important consequences became realizable. First, it was seen that programmed instruction could be used with many types of the "newer" media. And second, it was realized that large groups of learners could be instructed by films, tapes, radio, and television.[3]

Learning principles and operational guidelines relate to the development, production, testing and use of instructional-learning materials and appropriate media. These guidelines can be used in the same ways that blueprints and building specifications are used in the building of a home. The parallels between designing conditions for learning and designing a home to live in are close and suggestive.

Barriers to the uses of the "newer" media

Why have the "newer" media been so little used by educators in the arts? This is a good question for discussion, but shall I suggest a few conditions that seem right to me? The arts have enough media problems as presented by traditional or new approaches to the arts. Artists are always striving for qualities that are often modified or reduced by many of the "newer" media. This deterioration of quality is often very objectionable to the sensitive artists in education. Most visual media have limitations for presenting the works of arts and performances in the *full dimensions of space.* The apparatus of the media are often barriers to their use. With increasing complications of media and media systems, those who use them for instruction must surrender much control to the engineers and nonacademic media specialists. This loss of control is especially objectionable to the creating artist or to the art student. In many art media tactile and kinesthetic sensory modes are brought to bear, and these sensory modes are not included in the audio-visual media. The problem of when distant observations should be supplemented by performance has not been solved.

This list can best be extended by artists and those who teach art. Finally, I suggest that many of the objectives and blocks to the use of the "newer" instructional media result from the lack of intent or skills for mastering the media, for molding and using them for deserving instructional purposes, and of using them successfully.

The great fault to be found in the selection, adaptation, and use of media in art education is that we have not taken full advantages of all the possibilities. We have not systematically assessed, for example, how motion pictures or television could be used advantageously to show students their correct and incorrect performances; in more technical terms, to provide "feedback" to the learner. We have not made for use in education enough detailed, recorded models of the performances of talented artists to provide the kinds of models from which students can learn. Why, indeed, have we not used the distributive media to raise the levels of artistic literacy of millions of people in this country or in the world? The potentialities and possibilities of sound strip films for making accessible the art treasures of museums such as those we have here in Washington remain largely to be exploited. Extraordinary opportunities lie ahead, and we need to find and take advantage of them.

A proposal

In conclusion, I propose that *educators in the arts* establish a joint commission of artist educators, learning psychologists (with professional status in the media also), and media specialists to plan and propose a special national laboratory, dedicated to the exploration and development of the "newer" media for instruction and public education in the arts.

This laboratory may follow a small model of such a facility that was developed at The Pennsylvania State University during the early years of this decade. The purpose of the proposed National Art Education and Media Laboratory would be to conduct research and development programs on realistic problems of the producing and testing of significant blocks of instruction for students at all levels and the public. The empirical methods that have been demonstrated should be employed generally in the Laboratory, or perhaps artists would prefer to use the term 'research studio.' In the research studio a wide spectrum of research on students' learning of varied concepts and diverse skills of an art area would be beautifully combined with actual course-curriculum development and the production of public programs especially for television. This course of action provides a reasonable and productive alternative to the conventional committee-conference-discussion procedures for planning courses of instruction and curriculums. Given funds that are now available, the proposal for a national studio laboratory is practical and has proven potentials for providing evidence and useful materials which will answer many of the questions that this conference can raise, but probably cannot answer at this time because of the need for more evidence.

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RESEARCH IN INSTRUCTIONAL MEDIA AND ART EDUCATION

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The questions that come to mind immediately when we consider the application of research in the instructional media to the engagement in the process of artistic creation or the teaching of this process are: "What are the objectives of art education"? and "What, if anything, is unique about art education as distinguished from other kinds of learning experiences?"

The message from art education literature reveals that the particular set with which the art educator approaches his task is basically expressive and emotional; that is, it is anti-mechanical. Thus, there is a built-in obstacle to the acceptance and application of audio-visual media research, for the artist's perception of machine-mediated instructional materials is that they somehow dehumanize and mechanize the learning—or, in the case of art, the creative process. It is true that there are some potentially dehumanizing overtones to the entire technological direction of our society; yet, if we include the process of educating in our society, the automatization of much of teaching is a predictable conclusion.

The general problem we are directing ourselves to is that of searching for ways to optimize the teaching of art. The more specific intent of the paper is the determination of applications of audio-visual media research to art education. By "audio-visual media research" we mean the systematic study of such materials and devices as motion picture films, filmstrips and slides, projected transparencies, television, programmed instruction and teaching machines, textbook illustrations, exhibits, simulators, multi-media presentations, and computer-assisted instruction. This paper will consider the application of such research to the responses learners make to instructional materials, confining itself to the evidence from the research rather than reporting on the overall field of application of audio-visual media to the teaching of art.

Instructional media research and the art educator

How do learners respond to audio-visual media? Do these responses differ according to the characteristics of the materials used? Do they differ according to the individual characteristics of the learners? Are the generalizations from the research applicable to education in art? The art educator seeks answers to these questions when he prepares himself for the most efficacious use of instructional media.

Learner responses to instructional media

The main conclusions from research on the application of instructional media is that learners respond to them in a positive way and that such materials may, depending upon the conditions of use and the nature of the learning task, in fact enhance learning. However, there is nothing magic about the film or television or the teaching machine *in general.* No mode of instructional presentation has general superiority over the others—only an advantage, if any, as it results from the specific requirements of all aspects of the learning situation: the educational objective being served, the content being taught, the nature of the learner, the task being performed, the affective conditions prevailing at the time.

The supportable facts regarding research on comparisons of the different techniques of instruction show that the instructional media are effective in presenting factual information or in the actual presentation of stimulus material to be learned (1), and the art educator can use the audio-visual media with confidence. In fact, you have been prodigious users of the projected slide for just this purpose. There is also evidence that the motion picture film particularly is an effective medium for the presenting of models for emulation where motor skill learning is involved (1). Television has been an efficient carrier of instruction to widely dispersed groups and individuals without apparent loss of instructional effectiveness, but there is no evidence that televised instruction results in *increas*ed learning (4,17). Programmed instruction, also, promises to become a potent teaching instrument when it breaks the shackles of its present somewhat sterile form and applies its sound psychological principles to the modification of other instructional media.

The evidence is, therefore, clear. The instructional media are effective, even necessary, teaching instruments. Their application can extend over the range of art teaching objectives. And they may be used under certain conditions to vitalize instruction. But what *are* these conditions? And what are the *specific* instructional media indicated by them?

Characteristics of the instructional media

The key to the selection of the appropriate instructional media to use in any particular teaching situation is the relative effectiveness of that medium in accomplishing the desired educational objective. In other words, given a specific instructional goal, what is the best means of reaching it? Interestingly enough, in education there is little experimental evidence to point the way for the making of these instructional decisions. This is true at every level of teaching and in every subject matter area. It is true in the teaching of art, and it is true in the application of audio-visual instructional media to the teaching process. Gagne and Bolles observed, "relatively little of a systematic nature is known about how to promote efficient learning in practical situations" (9). And Gage stated that "the limited usefulness of learning theory in education has long been acknowledged" (6). This does not mean, of course, that we know nothing about selecting appropriate media for instruction in specific tasks. It is just that this knowledge has not been systematically organized into a useable set of operational procedures that might be applied to the teaching of art.

Over the entire range of art teaching you have, at different times, a variety of educational objectives. We will not argue the relative merits of the objectives in this paper, for this is your responsibility as art educators, and your literature is filled with discussions of this problem. Our task here is to relate the audio-visual instructional media to the accomplishment of these various objectives. This is a difficult task and has never been systematically applied to instructional media selection for art education. So the following attempt must be treated as very tentative at this time. It is presented here in the hope that art teachers will draw from it suggestions for instructional media implementation and not as a fully developed guideline to be arbitrarily applied to the selection of instructional materials. In *Table 1* a very rough and preliminary rating is given for the effectiveness of different instructional media types when used to accomplish six different learning objectives. It is suggested that this evaluative grid be used jointly with the following explanation of the media-objectives relationships. Those teachers who want to obtain a more comprehensive background in the determination of learning objectives and their relationships to instructional techniques are referred to the writing of Gagne (7,8) and Mager (19).

1. *Learning factual information.* This information such as names, dates, events, terms, definitions, etc., all of which have concrete referents. In the teaching of art these might include such tasks as learning the facts of art history, terminology, or facts about art media.

An abundance of audio-visual media research points to the effectiveness of films, filmstrips, television, and programmed instruction in meeting this educational objective (1). Unfortunately, however, although the research indicates that these audio-visual materials are effective, it does not tell us specifically what types of audio-visual media are indicated under what kinds of teaching conditions. That is, we have no evidence that would help us choose from a variety of materials that *particular* instructional medium that would be most effective. At this stage of our knowledge, one might conclude that the use of films, projected still pictures, television, and programmed instruction in the presentation of factual information adds little to student learning, and they are probably no more effective than such conventional types as print and oral presentation. On the other hand, films and projected still pictures do contribute greatly to the interest level of learners and provide a useful variety in the teaching. It should be pointed out that television is a *carrier* of information to the learner and probably possesses no particular characteristic that would make it more effective than any other instructional medium in teaching factual information. The characteristics of the television image are identical to that of sound motion picture image, but with significant degradation in picture quality. The educational differences between the sound motion picture and television are those related to the method of image display, the control that can be exercised by the teacher in using them, and the system of distribution of the images. From the standpoint of the teaching function, they appear to be the same. (However, Marshall McLuhan (20) would disagree, claiming that television is a different medium with different instructional characteristics just because of such features as degraded image and difference in display.) Research with programmed instruction (22, 23) indicates that factual information may be efficiently taught with teaching machines or programmed textbooks, but not necessarily more so than with other instructional methods. The use of three-dimensional objects or demonstrations probably is of little instructional value in the learning of facts as such.

2. *Learning visual identification.* This learning task will involve the use of visual cues to discriminate one element from another and will require the identification and naming of objects, words, or symbols. This type of task is one of the most common performed by human beings. In the teaching of art it might include such tasks as identifying shapes and forms, learning the characteristics of different art forms, recognizing works of art, "seeing" the various visual aspects of the environment, or discriminating among different shades and tones of colors. It would be expected that this learning objective would play a significant role in art education.

It has been shown that in instructional

situations where the initial presentation stimulus is similar to the performance or behavior in the final task to be learned, high positive transfer will occur (2,9,12,16,21). It is to be expected that such a condition would prevail in the learning of visual discriminations in art education. This means that the stimulus representations of the associations to be learned should be made as much like the stimuli in the performance or behavior in the final task as possible. It is apparent that conventional *printed* or *lectured* verbal stimuli have only symbolic similarity to visual identification learning tasks and would not be expected to transfer optimally to the final task situation. On the other hand, high amounts of positive transfer may be expected from *pictured representations* (such as films, slides, flat pictures) of simulus objects where the final task performance requires *crucial* knowledge of these objects (10). The purpose of visuals of this kind is to practice, in the learning situation, the response needed in the performance situation. Gropper has called these "criterion visuals" because the "use of visual presentations appears to be desirable in those subject matters in which visually perceived physical objects and events are integral parts of the criterion situation" (13). That is, the learner should be able to observe, describe, interpret, or reconstruct the precise content presented in the instruction.

It would appear, then, that audio-visual instructional media that closely represent the physical characteristics of this material being taught should be effective in the teachin of visual discriminations. Those instructional media particularly high in this quality are sound motion picture films, filmstrips, slides, photographic illustrations, and three-dimensional objects. Interestingly enough, however, little audio-visual media research has looked specifically at this problem. Rather, the research has tested the effects of stimulus materials that have mixed objectives; thus, it is not possible to determine the specific relationships of the instructional media used to accomplish a specific objective. The best we can do at this point is to say that the theory strongly indicates that instructional media of a representational nature would be highly effective in the teaching of visual identifications.

3. *Learning principles, concepts and rules.* This task involves the learning and understanding of relationships among things or events, the meaning of rules, or the principles pertaining to the functioning of different kinds of operations. In the teaching of art, this objective would be associated with learning of principles governing color or the understanding of the concepts underlying the various schools of art.

There is little experimental research with projected materials or television learning on this particular objective. However, a recent study by Gropper (14) used the programmed instruction mode to study the learning of science concepts and principles on the basis of either visual (pictorial) or verbal (print) presentation alone. Gropper found that when a totally *visual* (pictorial) presentation of the concept to be learned *preceded* a verbal (print) presentation of the same concept, the learning was significantly greater and took significantly less learning time than when the *verbal* presentation *preceded* the visual one. The importance of this study, for our purposes here, are twofold. First, it represents a systematic attempt to develop a *strategy* of instructional media use by manipulating certain variables and controlling others to arrive at a generalizable conclusion. Second, it presents some very convincing evidence in support of the effectiveness of visual (pictorial) presentations.

4. *Learning procedures.* This task involves learning to carry out a sequence of acts or operations in the proper order. In the teaching of art, these might be the learning of the procedure for the making of a silk screen print or the procedure to follow in preparing art media for use. Because of the fairly simple nature of the *order* of most art procedures, this learning objective may not be as important as the others. There is no recognizable audio-visual research relating directly to this problem, but it might be expected that sound motion pictures, televised instruction, programmed instruction, and demonstrations would be the educational media most apt to enhance such learning.

5. *Performing skilled perceptual-motor acts.* This task involves the use of simple and complex perceptual-motor skills for performing a manipulation task. In the teaching of art, this might entail the learning of proper manipulative techniques with art media such as the handling of tools, watercolor washes, etc.

There is little doubt about the effectiveness of films in teaching perceptual-motor skills, particularly when students are given opportunities for active participation during the presentation process (1,15,18). Studies using the repetitive 8mm film-loop for skill training have demonstrated the efficacy of this promising instructional technique (24). For the art teacher who wishes to develop specific perceptual-motor skills and to give students an exemplary model to follow, there would appear to be a sound research base for the employment of motion picture films, particularly if they are used creatively (stopping for practice, repeating, etc.) rather than merely as one-way one-time communication media. If the teacher will use the repetitive 8mm film-loop and build in opportunity for student participation, skills learning will probably be greatly enhanced.

Making proper use of instructional media in teaching

In the previous section and in *Table 1* some rough guidelines were presented as aids to the proper selection of instructional media under different conditions of learning. It is suggested that the following step-by-step procedure be used in order to make the most éffective application of instructional media to art teaching:

1. *State the exact behavior to be expected of the learner.* In other words, as a result of your teaching of a specific lesson or sub-lesson, precisely what will the student be expected to learn or what skill to perform? This should be stated in very specific behavioral terms (8,19).

2. *Identify the type of learning objective being met by the instruction.* Descriptions of types as they relate to art education are presented in the preceding section. These types are also the column listings in *Table 1.*

3. *Write down the particular "instructional event" that will occur* (such as, "Introduce the art materials for silk screen printing" or "Demonstrate the procedure for silk screen printing"). From *Table 1* select the appropriate instructional media options (such as "demonstration procedure" or "film of procedure").

4. *Determine availability of the instructional media* to meet the educational objective (from school materials, audio-visual catalogs, personal resources, etc.).

5. *Arrange for preparation of unavailable instructional media.*

The preceding five steps may appear to be unnecessarily detailed, and the art teacher, of course, will not be able to follow them for every lesson. They were presented, however, in the belief that if the teacher has a clear conception of his objectives and the behavior expected from his students, he will be able to make more intelligent media selections. This method substitutes a procedure that uses reasoned choice based on some set of standards for a procedure that operates merely on the basis of what materials are available. As a result, the quality of instruction should be improved.

Relationship to learner characteristics

Some time ago C. R. Carpenter (3) expressed the opinion that the effects of film instruction, within certain limits, depend more upon the characteristics of the perceivers, individuals, and audiences than upon the elemental variables within the films themselves. That such is the case has not been studied experimentally, but it is clear that there is some interaction between the characteristics of learners and the instructional media used. Just what these interrelationships are has not been investigated although recent studies are seeking answers.

Gropper (14) has just reported that students of below average IQ receiving instruction in programmed textbooks on science concepts learned more easily by means of discrimination practice based on visual (pictorial) stimulus and visual (pictorial) response options than by means of verbal (printed) stimulus and response material. He suggests that below average students can respond to visual examples better than verbal examples because they have had considerable prior experience in responding to the concrete attributes of physical objects and events; it is a relatively easy task for them. Recent interest by art educators in a so-called "visual ability" in learners raises the question of the relationship of this special aptitude to learning from visual materials. The evidence is inconclusive at this time although several investigators are studying the problem. Dawson (5), in a study of figure/ground graphic configurations, found that students with high "figural ability" scores on the Guilford-Zimmerman Aptitude Survey recognized significantly more correct configurations than those with low "figural ability" scores. Gagne and Gropper (11), on the other hand, failed to reveal any significant relationships between visual aptitudes and a person's capacity to profit from visual presentation.

General conclusions

The overriding conclusion that emerges from an objective assessment of the audio-visual instructional media field is this: motion picture films, filmstrips, pictorial illustrations, programmed instructional techniques, etc., are obviously highly useful in instruction under certain conditions. All art teachers have had experience with their use; and this experience, based on impressions or even on the impact such materials make on students, has added up to a generalized belief that these audio-visual instructional media have value in teaching. The problem, however, is that when we look to the research literature for evidence on the particular effectiveness of specific kinds of media, we find that such precise verifying evidence is lacking. To be sure, numerous evaluative studies demonstrate the effectiveness of these materials *in general*. But we just do not know the *specific* conditions under which audio-visual media are most effective.

It was the intent of this paper to point up some of these problems, to present a preliminary kind of taxonomy that might assist the art teacher in determining his instructional objectives, and to point out some of the areas in which audio-visual instructional media might be useful in art teaching.

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TABLE 1. Instructional Media Stimulus Relationships to Learning Objectives.

	LEARNING OBJECTIVES:					
INSTRUCTIONAL MEDIA TYPE:	**Learning Factual Information**	**Learning Visual Identifications**	**Learning Principles, Concepts and Rules**	**Learning Procedures**	**Performing Skilled Perceptual-Motor Acts**	**Developing Desirable Attitudes, Opinions & Motivations**
Still Pictures	**Medium**	**HIGH**	**Medium**	**Medium**	**low**	**low**
Motion Pictures	**Medium**	**HIGH**	**HIGH**	**HIGH**	**Medium**	**Medium**
Television	**Medium**	**Medium**	**HIGH**	**Medium**	**low**	**Medium**
3-D Objects	**low**	**HIGH**	**low**	**low**	**low**	**low**
Audio Recordings	**Medium**	**low**	**low**	**Medium**	**low**	**Medium**
Programmed Instruction	**Medium**	**Medium**	**Medium**	**HIGH**	**low**	**Medium**
Demonstration	**low**	**Medium**	**low**	**HIGH**	**Medium**	**Medium**
Printed Textbooks	**Medium**	**low**	**Medium**	**Medium**	**low**	**Medium**
Oral Presentation	**Medium**	**low**	**Medium**	**Medium**	**low**	**Medium**

TABLE 2. Equipment/Media Relationships and Considerations.

Instrument	Media Used	Materials Production Considerations	Availability of Facilities and Equipment	Equipment Cost
1. Filmstrip or slide projector	35mm filmstrips or 2x2 slides	Inexpensive. May be done locally in short time.	Usually available. Requires darkened room.	low
2. Overhead transparency projector	Still pictures and graphic representations	Very inexpensive. May be done locally in short time.	Available. May be projected in light room.	low
3. Wall charts or posters	Still pictures	Very inexpensive. May be done locally in very short time.	Available. No special equipment needed.	very low
4. Motion pictures (projection to groups)	16mm motion picture (sound or silent)	Specially-produced. Sound film is costly and requires 6-12 months time.	Usually available. Requires darkened classroom.	moderate
5. Motion picture projection as repetitive loops (8mm silent) to individuals	8mm motion picture film (silent)	Special production normally necessary. May be produced as 16mm film alone or locally at low cost and in short time.	Not normally available. Will need to be specially procured to meet requirement of instructional program.	low per unit, but moderate for groups
6. Magnetic tape recorder	¼″ magnetic tape	Easy and inexpensive. Usually produced locally.	Available	low
7. Record player	33⅓, 45 or 78 rpm disk recordings	Need special recording facilities. Usually commercially made.	Usually available	low
8. Display area	3-D models	May vary in complexity and in difficulty of production. Component parts easy to obtain.	Available	varies from low to high
9. Television (closed-circuit)	Live presentations. Motion picture film. Videotape recordings. Still pictures.	Normally requires large and skilled production staff.	Not normally available	moderate to high
10. Teaching machines & programmed textbooks	Programmed material	Some programs available commercially. But will normally be specially prepared for course.	Not normally available	low per unit, but moderate for groups
11. System combinations	Television. Motion pictures. Still pictures. Audio recordings.	Complex. Probably will be done locally to meet specific requirements.	Not normally available	moderate to high

INSTRUCTIONAL MEDIA AND ART EDUCATION: A PROSPECTUS OF OPPORTUNITIES AND RECIPROCAL CONCERNS

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Many educators, teachers, and laymen have doubts and misgivings about the growing use of machines and "gadgets" in the schools, particularly those that entail the capability of recording and/or amplifying the distribution of instructional presentations (as in the case of television), and those that "automate" instructional functions (as in the case of programmed instruction, electronic classrooms, and the like). Among the most explicit critics of technological developments have been such representatives of the literary community as Joseph Wood Krutch, and certain staunch defenders of the more traditional academic practices who fear that new media may "water down" content, or interfere with the development of reading skills. Another common concern is the fear that machines may "dehumanize" education. Less frequently expressed, but no doubt present is also the uneasiness on the part of teachers who sense that the changing patterns of instruction may constitute a very real threat to the privacy of their classrooms, and to their autonomy as individual teachers.

Several years ago, James Finn suggested a connection between the critics of recent technology in education and the literary intellectuals" who constitute the anti-scientific anti-technological culture of C. P. Snow's analysis: "The Two Cultures and the Scientific Revolution" (11). If there is indeed a fundamental cleft between the literary-humane and scientific-technological segments of modern culture, and if this separation permeates education, how does this involve art education and its use of newer media of communication? Is the technical aspect of change in contemporary education considered destructive or inimical to the arts? There are some who feel this is so, and possibly not only those who teach the humanities but all men of this age are to some extent ambivalent on this question. Bruno Bettelheim has pointed out that modern man, when haunted, is not haunted by other men, but by machines (4). Add to this 20th century psychological syndrome Lanier's observation that art education does not present a tidy, systematic and well-defined body of subject-matter, that it is concerned not only with cognitive but also with attitudinal and qualitive ends[1]—add these facts, and the application of instructional technology, with its emphasis upon quantitative distribution of information, exact specification of instructional objectives, and precise measurement of outcomes, presents at least some questionable aspects.

If a part of contemporary man is hesitant, defensive, and skeptical toward the continued advance of technology, there is another part that faces the hard fact that it is there, inextricably woven into our lives, that there is no way to deal with the present, nor to face the future, without it. In its largest aspect, the problem is simply to carry through and extend the benefits of the scientific revolution to the underdeveloped areas of the globe. As Snow puts it, "There is no excuse for Western man not to know this. And not to know this is the one way out through the three menaces that stand in our way—H-bomb war, overpopulation, the gap between the rich and the poor. This is one of the situations where the worst crime is innocence" (34, p. 48). Not everyone agrees with Snow, but no one should ignore his argument. What he is saying in effect is that we can't have a world that continues split in two parts: one enjoying the benefits of modern science, the other held in a state of deprivation and enslavement to the brute demands of physical survival because it is still living in the past. If this is a viable argument for world civilization as a whole, why does it not also apply internally to the various institutions or other elements of a particular culture? Of all activities in our society, education should demonstrate the most advanced use of science and technology in the discharge of its own functions. We can't turn back the technological clock as the Erewhonians did in Samuel Butler's novel. But we can strive to "humanize the machine," as Lewis Mumford insists we must if man is to survive. And if this goal is truly important, what better place to demonstrate how it might be realized than in education? It is becoming increasingly apparent that education is still trailing far behind the technological potential of our time (7). What is perhaps less obvious is that education offers a proving ground where, if anywhere, man can test his ability to enhance human living through technology without letting the development of the means become an end (and thereby, a dehumanizing force) in its own right.

Could a relationship of mutual understanding and reciprocal "trading off" of values benefit both art education and the use of modern technology in education? With such an end in view, what might art and the artist-teacher do to improve educational media and promote their wider and better use? This will be the subject of a later section of this paper, but first we need to view the problem in its cultural context.

Art and technology

What does the artist or the artist-educator see when he looks toward technology in society and in education? Beck (3) has noted a broad spectrum of points of view which divides, roughly, into two bands. On the one hand are the artists, philosophers, critics, and others who believe that we live in a "waist-high" (15) culture in which a combination of political, economic, and technological factors tend to proliferate and diffuse art, and to degrade it at the same time (3, p.3ff). We live in a "kitsch" culture of slick commercial art, television commercials and comic books. One observer makes the comment that technology inevitably makes a commodity of art and thus cheapens it (5). Another finds that "there is a blending of technics, commerce, and art that blurs distinctions between good and bad art" (20, p. 15). Machine production offers exciting opportunities to the designer, but in the final analysis he is thwarted because "he is relatively insignificant in the overall picture—" and "—he is not able to have that final and necessarily unequivocal word in his own area" (20, p. 22). Moreover, "even when good design is a deliberately planned feature of a mass-produced article, the countless repetitions of its shape defeat the aesthetic purpose" (20, p. 23). Beauty palls when it is seen in "endless reiteration." Thus, it would appear that there is a kind of unavoidable, built-in, conflict between technology and art, truly and "inevitable" war between creative art and the taste of a mass culture. The view is fundamentally pessimistic because the conflict and the "war" are considered to be unavoidable and irremediable. Because these are the hard "facts," the modern artist is forced to guard his integrity by some sort of voluntary separation from society and the body politic (20, p. 26ff.). This estrangement, this "lingering spiritual isolation" of the artist has educational implications which will be discussed later.

Although pessimism is the predominant attitude among artists and critics, Beck reminds us that there is also a substantial body of opinion which leans toward the position that possibly the conflict of art and mass culture may not be so unresolvable after all (3). Some believe standards of taste can be improved. Mass communication has enlarged the audience of fine art. Not only is the modern artist challenged to give creative expression to the technological character of his time; there are those who would perhaps agree with the comment that, "The beginning of wisdom seems to lie in the perceptive resolution to accept, to understand, and to make use of the technology of the machine for the enjoyments of art creation and appreciation" (3, pp. 5-6). The full implications—the logical conclusion—of such a rapprochement were perhaps best expressed by the Bauhaus group who insisted that the distinctions between the fine and the applied arts were artificial, that technology and aesthetics could and should be joined in a society where the functional application of art and design would enhance the quality of living for all.

Obviously, the two broad positions just outlined have important implications for education, and for the more specific question: what do artists and art educators see when they look toward the newer educational media? Both the pessimistic and the optimistic points of view are represented in Kaufman's recent and penetrating analysis, "Art and Education in Contemporary Culture," excerpts of which appear in the 1965 "Report of the Comission on Art Education" (20). Art education has a responsibility "to assess the inherently evocative aspects and the comparative worth of the environment," in a larger sense, to attempt to bring an environment of greater worth and beauty into being (20, p. 26). Educators, says Kaufman, should be mindful of Lewis Mumford's insight into the dichotomy of "those things of meaning with no use, and things of use with no other meaning" (20, p. 26). *But*, at the same time, the art educator must remember that, "Socially, as well as spiritually, the common American metier is indifferent or hostile to art" (20, p. 25). We live in a predominately visual culture, because technology and the resulting complexities of modern living require a mode of communication which can efficiently "integrate man into the gears and energies of the machine" (20, p. 16). But the visual opportunities and requirements of technology should not be confused with the concerns of fine art, per se. The two visual approaches appear to be essentially irreconcilable. Any attempt to combine them, though laudable in a democratic setting, "simply neglects too many facets of art" (20, p. 33). To lump fine art together with commercial and industrial art tends to blur qualitative distinctions, to neglect the "fundamental and uncorrupted qualities of art" (20, p. 33).

Kaufman's charge to art education is clear. It is also ambivalent, and the ambivalence is there because it is in the culture. Art education has the responsibility to try to produce a culture of greater integrity and worth, but it also has a prior responsibility to "look to the vital core of art, to the ongoing yet changing traditions of creative search" which are most often found in "fine art" (20, p. 34). To the extent that cultural enhancement seems to imply wider participation in functions not directly related to fine art, the artist and the art educator appear to be caught in a bind. Torn between two conflicting claims, the prior one requires the artist-educator to behave in such a way as to perpetuate the bind, not to relieve it. Does this mean that the voluntary withdrawal of the artist—his alienation from a culture that can only prostitute his work—extends to the artist-educator too? At any rate, this is the ambivalence—the dilemma—so vividly exposed in Kaufman's analysis.

Education in the new age of the visible

Never before has the world been made so visable. Man has always been a great "looker" but never has he spent so much time just looking as he does now. Instead of a sketch pad, modern man has his camera; instead of a book he has his television set. This is probably not quite accurate, because many who have television wouldn't have been readers in the past. But there is enough truth, here, to prompt the observation that we live in a period of "retreat from the word" (35). Despite the fact that more books are printed and sold than ever before, there seems to a growing number of observers who note, and frequently regret, that we live in what McLuhan has called a "post-lingual" age (28). Is it really that? In this writer's opinion, McLuhan's statement is provocative but typically extravagant. The word is far from dead, despite Steiner (35), McLuhan (28), and others who write so many words explaining why words no longer really matter. What is more to the issue is that we are living in a "new age of the visible" (37). The point is not that words no longer matter, but that the visual image does. The whole world of nature, the current human scene, and the cultural resources both past and present have become increasingly visible to the common man, through the mass media and through modern techniques of reproduction.

The revolution now taking place in educational technique is not merely one of technology, it is also a revolution in basic modes of communication. The recent burgeoning of programmed instruction, among other things, has tended to obscure, somewhat, the "visual" aspect of what we used to call "audio-visual" education, but the increasingly "visual" character of current instructional processes, as well as communication in the total society, is still a matter of primary importance and concern.

Isn't it possible that the educational media, specialist and the artist-educator-teacher have a common stake in "the new age of the visible?" It is interesting that both of these fields are conscious of critical transition, that both are seeking a clearer definition of their respective identities and roles in modern education. For the past several years the Department of Audiovisual Instruction has been engaged in an effort better to define, possibly even to rename its field of professional endeavor. Art educators, I am told, "are deeply conscious of the pressing need to change both the conceptual bases and the contents of curricula on all levels."[1] Perhaps both areas could gain some added degree of insight into their respective identities by looking more intently toward each other. This paper has already indicated some of the problems perceived by the artist-educator when he looks toward technology in the larger, cultural framework. But what is the prospect when he confronts the newer educational media, per se? Aside from the obvious advantages afforded by improved "linkage" between art classrooms and the store of communication generally, I propose that the artist-educator, the teacher, and the media specialist are confronted by a series of challenging questions, something like the following:

Could artist-educators and art teachers help to develop a better understanding of visual communication (of content other than the art form itself) and the skills it requires? Modern art education is interested in creative expression and in art appreciation. Discussions of curricular objectives also mention "visual literacy," which involves acquaintance with contemporary "symbol systems," (24) also rather subtle abilities which involve "insight into the poetic and imaginative aspects of human experience," and "recognition of the potency of visual form and structure in all avenues of everyday life" (2, p. 70). Does "visual literacy" require that the learner become visually "articulate" in some degree? I'm not quite sure how an artist or art teacher would respond to that question, but it is interesting that most educators and patrons of American schools do not seem to place much value upon the simple (?) skill of drawing. In an essay on this matter, Fleming suggests that our society does not have a high regard for pictures as a reliable means of purposeful communication, nor as mediators of significant intellectual content (12, p. 223). We go to great lengths to make sure that everyone can read and write, but the fact that most Americans are pictorially inarticulate is taken for granted. Unfortunately, the contemporary "image" of pictorial communication seems to center upon such forms as the stereotype TV commercial, the comic book, the cliches that appeal to the lowest common denominator of taste in advertising and mass entertainment. These symbols of mediocrity and intellectual poverty spring to mind much more readily than the fine work of highly skilled artists who have contributed so much to the recording and dissemination of scientific and other useful information since the time of Leonardo's anatomical drawings, and far beyond that, back into the earliest dawn of human civilization.

The popular reaction to "purposeful" pictorial communication is certainly not unreceptive. The public today, as I imagine was always the case, reacts with spontaneous interest and delight to the felicitous drawing or painting of a natural object or event, particularly when the subject matter is of high intrinsic interest. Good photographic illustrations are similarly received. But the acceptance of graphic communication is ambivalent, and often tinged with an element of intellectual condescension, particularly in the case of the more highly educated. The picture is supposed to represent a pleasing, but also an easy and superficial approach to learning. Krutch has expressed this attitude: "Are what our school principals call 'audio-visual aids' usually anything more than concessions to the pupil's unwillingness to make that effort of attention necessary to read a text or listen to a teacher's exposition?" (22, p. 134).

Even in the new age of the visible, there is still a strong tendency to think of pictures merely as pleasing but intellectually inferior substitutes for words, and not as a distinct and complementary mode of communication with a unique intellectual and emotional power in its own right.

Contemporary man has accentuated the distinction between fine art and useful art; at the same time he has widened the gap between the artist and the ordinary man—to the point that the artist frequently feels that he is alienated from the culture, and the ordinary man, in return, sometimes feels that the artist is strange, or "way out." Could it be that the graphic inarticulateness of the common American is a sign of this separation of art and ordinary experience, that the current low evaluation of pictorial communication in this culture is also somehow related to the separation of art from every-day, "practical" functions and concerns? Some artists say that to draw, one must first be able to see. In order to understand and appreciate pictorial communication perhaps one must know what it means to see—whether the object of perception is merely the subject, as in ordinary pictorial communication, or the subject *and the seer*, as in the case of what we ordinarily call "fine art."

The difference between the two kinds of seeing and the two kinds of art is not a trivial one, but it is also probably not absolute, rather a matter of degree. John Dewey once said that the only fundamental distinction in art is between good art and bad art, not between the fine and the useful. The greatest works of art are found in "fine art." But the prevailing public attitude that fine art is about all there is to art tends to encapsulate the creative work of the artist in a kind of ethereal shrine which lends a feeling of mystery and unreality, sometimes a lack of serious intellectual purpose and pertinence, to the whole artistic enterprise. The other side of the coin is that matters of practical and intellectual import are not considered to be a proper subject for the artist, or else the subject matter is not considered to lend itself to pictorial treatment without diluting or compromising its intellectual value. If the supposed dichotomy between fine art and graphic communication were not considered to be so final, so absolute, possibly it would be easier to see the intellectual dimension of fine art and its place in every-day living, as well as the aesthetic dimension and the validity of graphic communication in matters of practical and intellectual concern. This is not to suggest that all pictorial communication is just like fine art, nor vice versa, but only that the purposeful communication of information and ideas by means of pictorial or other iconic signs has a potential for creative expression which lends itself to artistic as well as scientific analysis of the nature of the picture and its function. There is no such thing as a picture that merely represents the object, just as there is no such thing as a work of fine art that merely represents the artist. Somewhere along the continuum between fine art and representative pictorial communication there must be a meeting point, a common ground of interest for the artist-educator-teacher and the media specialist. This common ground has something to do with the nature of the picture, or iconic sign, in its representative, communicative capacity—a matter that will be considered, briefly, next.

Could art educators and artist teachers work with media specialists to help develop a better understanding of the relationship between the eye and the mind? Thus far, there is no adequate theory, certainly no science of audio-visual instruction, and one of the principal reasons for this is the lack of a theory of visual-pictorial signs and their function in communication. However, this lack has become conspicuously evident, and we are now in a period of accelerating growth of interest in the problem. Building upon a broad foundation of audio-visual research dealing mainly with media, their characteristics, and their effects under varying conditions of use, a series of recent efforts have been more closely focused upon pictorial signs, as such. Some of the recent, and not quite so recent, research and theoretical monographs have drawn upon sources in the psychology of learning (29, 16), psycholinguistics (21), perception theory (13, 30), information theory (36), "kinesics"[2] (18), philosophy, and others. Conspicuously missing in the educational media literature, however, are any attempts to develop a theory of pictorial communication related to art. This circumstance may be due in part to the breach between fine art and art as applied to "useful" communication already mentioned. However, it may be that the almost complete absence of references to art in the current theoretical writings in this area is also related to the more ancient notion which subordinates sensory-visual experience to the realm of mind and verbal discourse in such a way that pictorial communication is assumed to have "serious" intellectual content only to the extent that pictures serve as substitutes for verbal propositions. Unfortunately, this notion not only characterizes some of the sharper criticisms of audio-visual instruction; it also exercises a subtle but pervasive influence on much of the research that is conducted by psychologists and media specialists, themselves.

The contrary assumption that visual-perceptual experience is an integral and vital function of total behavior, complementary to verbal discourse, but not comparable to it in the sense of an "inferior" or "superior" substitute has been supported recently by Agnes Arbor, an English biologist, in a scholarly and provocative little book called, "The Mind and the Eye" (1). This publication deals with the function of visual experience in science, and particularly in the work of the biologist. While it is not a book on pictorial communication, as such, its bearing on that subject is made quite obvious in the following brief quotation: "It can scarcely be denied that the use of pictorial imagery in thinking is a fundmental need of the human mind. Though philosophers have often inveighed against it, as vitiating abstract thought, it cannot possibly be discarded from our mental toolchest" (1, p. 122). Arbor rejects the notion of a sharp disjunction between mental and visual thinking, which she attributes to the conception of the brain and sense organs as discrete entities. She finds "there is no such severance in reality, though there is differentiation and division of labour." (1, p. 124).

The whole nervous system is a unity in which the brain and the sense organs function as parts of an indivisible whole. However, this integral functioning does not mean that the brain is degraded and merely registers, machine-like, the impressions channeled through the sensory organs. On the contrary, Arbor insists that "we are too apt to think of pictorial images in the mind as if they had a quality of literal 'correspondent' truth to external objects" (1, p. 116). What we can see in fact is not merely what is there in the "raw" mosaic of retinal stimulation, but rather this mosiac as played upon and made into a symbolic pattern by sensory organization (1, p. 116). Much as an artist might put it, the biologist sees only what he is able to see; "perception depends upon preparedness of mind, as well as an actual visual impression" (1, p. 117). To say that perception is thus ordered by the mind might seem, at first glance, to reinstate the dominance of mind over sense which is the very concept that Arbor sets out to challenge, but such an interpretation misses the point. Mind *is* the element of control or organization in the patterning of sense experiences, not an independent entity. The eye serves the mind, but it is not so much a servant as a junior partner—"the partner to whose vitality the firm owes much of its vigour" (1, p. 119).

Whether we are concerned with direct visual experience, as in the case of scientific observation, or with mediated visual experience, as in the case of pictorial communication, there is a junction—a meeting place—where the artist, the scientist, and the media specialist all have something in common to talk about. It is not easy to define this area of common interest, partly because we still know so little about pictorial communication, and partly because the artist's function in "useful" communication is so often taken for granted, or else forfeited. The idea that pictorial communication has a significant *creative* aspect, which challenges the artist *and* the scientist alike, is obscured by a certain intellectualistic strain in the culture, already mentioned. It is also obscured by theories of perception which tend to absorb the problem of seeing in the analysis of a stimulus, and possibly by the continued dominance of learning theory by the classical S-R paradigm. This is not to say that the theories just mentioned are "wrong," merely that they do not seem to afford a language suitable for talking about the "artistic" aspect of pictorial communication. It may well be that this whole subjetc is elusive and obscure for the very reason that we have not yet found a language to describe it. About all we have at this time are some suggestive starting points in philosophical writings, and to some extent in the psychology of perception. Langer, for instance, suggested a possible value of pictorial communication when she noted that "Language, in its literal capacity, is a stiff and conventional medium, unadapted to the expression of genuinely new ideas, which usually have to break in upon the mind through some great and bewildering metaphor" (23, p. 164). Granted that a metaphor is usually a picture expressed in words, still the effect is evoked through mental imagery, which suggests that pictures could produce a similar effect, in some cases, possibly a much better one.

A primary concern of this paper is to emphasize the hypothesis that intellectual growth and creativity can be fostered through the use of pictorial communication, and that such use of visual imagery in education calls for direct participation of the creative artist and especially the artist-educator, in the development of the use of newer media. This hypothesis is based in part upon the speculative assumption that there is a nexus, a common ground, between the creative act of the artist and the inventive behavior of the scientist an assumption that will be examined further in the final section of this paper. Just how the artist or artist-educator-teacher might participate more fully in the development of the use of newer media in education, in its scientific as well as its creative aspects, will be considered next.

How could artist educators and art teachers take a more systematic and effective role in the growth of the newer media, in educational media research, and in the identification and development of needed and better instructional materials for art education? In a "Statement on Art Education for the Media Specialists." sent to the four "media people" participating in this symposium, Dr. Lanier stated that, "In many ways the time is now ripe to examine what we (art educators and teachers) can do for media." The timing of this statement could hardly be better, in my opinion. We have already noted that both fields appear to be in a state of transition and self-questioning. New resources for the implementation of technological innovations in education are suddenly abundant. Interest is picking up in the further development of an urgently needed theory of pictorial communication, in which representation of the art point of view could be most helpful. The field of art education, in itself, appears to represent a vast potential for more and better visual instructional materials, and for other applications of instructional technology.

As far as this writer is aware, there has been very little communication or cross-fertilization between the two fields. Art educators do not appear at the meetings or take part in the programs of media specialists, nor vice versa—this symposium being a notable exception. There is a much closer tie between the educational media and certain varieties of "communications" specialists whose interests tend to shade off into the fields of language and journalism, rather than toward the non-verbal. There are, of course, a number of artists and designers who have made notable contributions to the media as producers, but that's about it.

What is needed, in this writer's opinion, is a framework, possibly a well-chosen liaison committee, set up at first on an ad hoc basis, to consider and define the mutual interests of art education and the newer media; to arrange for appropriate cross-representation of these interests on programs of national meetings of the two professional organizations, with suitable exchange of visiting speakers; to explore ways of dealing cooperatively with research and theoretical problems of mutual concern; and to examine the possibility of promoting a better flow of communication among users and prospective users of art instructional materials, producers, and researchers who might well be media specialists, artists, psychologists, or all three. Such a committee would presumably give its attention to the entire range of instructional technology and media, but the focal center of its concern, I believe, should be the non-verbal, visual-pictorial factor in education. By emphasizing this logical bond its chances of survival and success would be improved.

The writer does not envisage a union in which all art educators would become constantly absorbed in problems of media, and all media specialists would become artists, although, hopefully, a continuous exchange of points of view would eventually take place on a broad basis—to the mutual benefit of both fields. The intent in this regard is not to blur the distinction between art and the instructional media, but to make what is distinct or unique in both fields come into sharper focus by clarifying what they also have in common. In the long run, the only way to ensure a lasting and meaningful relationship would be to demonstrate that greater and more effective use of the newer media is not only consistent with, but necessary to, the wider achievement of humane goals in art education. This achievement, in turn, is contingent not merely upon the further development and application of technology, on the one hand, nor the affirmation of a sound philosophy of art education, on the other—but the extent to which these two factors can be infused with a common purpose. The cultural background of this problem was discussed in an earlier part of this paper. In the concluding section an attempt will be made to relate both the broader cultural and instructional aspects of this problem to the dominant goal of creativity in art education.

Art education and the meaning of creativity in moden culture

J. Bronowski, in his provocative book, "Science and Human Values," (6) proposes that science and the humanities are not conflicting elements at war with one another, but integral parts that make up the whole of modern civilization. In his penetrating discussion of the common ground between science and art he seeks "to display the links which give society its coherence, and more, which give it life" (6, p. 6). In a discussion of scientific insight, Bronowski points out that the scientist, contrary to an all-too-frequent stereotype, doesn't arrive at discoveries or new truths by mechanically adding up the dry facts, but rather by creative, almost intuitive, leaps of the imagination. "Copernicus found that the orbits of the planets would look simpler if they were looked at from the sun and not from the earth. But he did not in the first place find this by routine calculation. His first step was a leap of imagination—to lift himself from the earth, and put himself wildly, speculatively, into the sun. 'The earth conceives from the sun,' he wrote; and 'the sun rules the family of stars.' We catch in his mind an image, the gesture of the virile man standing in the sun, with arms outstretched, overlooking the planets—" (6, p. 12). Bronowski goes on to suggest that Copernicus might have taken this mental image from drawings which the Renaissance teachers put in their books on the proportions of the body, or even from Leonardo's drawings of his pupil, Salai.

There is a likeness between creative acts of the mind in science and in art, and this makes it possible, even necessary, for each to draw upon the other. The scientific enterprise is not to collect facts, basically, but to discover order in the variety of nature. But "discovery" is not the exact word. Neither science nor art sets out to copy nature. As Bronowski puts it, "Reality is not an exhibit for man's inspection, labeled, 'Do not touch.' There are no appearances to be photographed, no experiences to be copied, in which we do not take part. Science, like art, is not a copy of nature but a re-creation of her. We re-make nature by the act of discovery, in the poem or in the theorem. And the great poem and the deep theorem are new to every reader, and yet are his own experiences, because he himself re-creates them—" (6, p. 41).

The creative act seeks unity in disparate or conflicting elements, and this is fundamentally the same whether in science or in art. This idea, which pervades Bronowski's book, is highly suggestive to the educator, the artist-educator, and the instructional technologist, alike. For the educator, it shows the universal quality of art and its relationship to other aspects of learning, especially in science. It should help to remind the artist that his quest for creative expression cannot fully be realized in some state of isolation or quasi-isolation where he is "free" because he is cut off from functioning relationships with other creative elements in the culture. Finally, Bronowski's idea of creativity should serve to remind the educational media specialist that the solutions to instructional problems are not merely "given" by technology—to allay the misconception on his part, or on the part of others, that all he needs to do, or intends to do, is to apply media, the machine, the computer, as a kind of self-contained mechanical solution to the problems of education.

Returning to a theme that was partially developed in an earlier part of this paper, Bronowski and C. P. Snow have outlined a problem that is of deep concern not only to education but to contemporary civilization as a whole. The main criticism of their theses (and this criticism is still very strong, today) seems to me to stem from sources in a tradition that goes back to the Aristotelian conception that liberal education is for a leisure class whose intellectual aesthetic interests are free because they are not related to, nor constrained by, utilitarian purposes. Today, few would argue that education ought to be restricted to a privileged leisure class, but the notion that education can be truly liberal only if it is completely separated from "practical" or occupational interests still persists. This injunction may be taken in its bald form, which in the case of art education, would seem to imply an intrinsic qualitative difference between the teaching of fine art and useful art—or it may be taken in the somewhat modified form found in Kaufman's analysis of the ambivalence or dilemma of modern art education, already cited. In the one case, we are dealing supposedly with a "natural" difference in kind: liberal education *is* not practical or occupational education; fine art *is* not useful art, and the artist or artist-educator has no direct concern with "useful" or "practical" communication. In the other case, as in Kaufman's analysis, it is not so much that there are two intrinsically different kinds of education or two kinds of art as the need to protect what is "fine" in one by not allowing it to be contaminated or prostituted by involvement in useful applications. The irony, here, is that the form of such protective measures in art or art education tends to be a kind of withdrawal from the very problem that makes the protection necessary.

Dewey's observation that there is only one fundamental distinction: that between good art and bad art, has gained some acceptance, particularly in the recognition of the modern artist-designer and the architect, who in some cases, at least, manage to bring good art to useful fruition. But there is still a great deal of argument to the contrary, and this seems to be backed by more than ample evidence that the production of articles of use in modern society is geared almost invariably to the lowest common denominator of taste or to the esthetically ruinous effects of standardization. Only the rich are able frequently to call upon the services of the designer or the artist-craftsman whose products may approach the level of works of art. Hence, the generic distinction between fine art and "useful" art tends to persist—not because this is a necessary, intrinsic condition of quality, but because social and economic motives which are not indigenous to creative work tend to dominate the production of useful objects, whereas artists who might be good designers and craftsmen may prefer "non-useful" art because there are fewer external constraints on the product or upon the conditions of its creation. However, the intent, here, is *not* to suggest that the dichotomy would be resolved if all artists were occupied in producing "useful" objects or products. It seems to me that the most useful of all works of art are those that have no "use" save to bring fresh meaning and the lift of creative insight to human experience. The relative scarcity and high cost of good art, whether it is "fine", or in some "useful" form, still tends, somewhat, to sustain the ancient notion that art is for, and is sustained by an elite class—sometimes regarded as an intellectual elite—whereas the mass of the population is supposed to prefer, or at least to be more tolerant of, the mass-produced standardized article, the cheap sententious painting, the grade-B movie, or the plethora of repetitive, cliche-ridden, and tasteless programs that constitute the "vast wasteland of television." The fact that this is indeed the case is perhaps *both* a cause and a result of the continued separation of art and science-technology in this culture. Ziegfeld has proposed that art and science need each other. "Science needs the humanizing qualities of the arts. The arts need the sciences in order that they be deeply rooted in the life of the times. The great task facing us is to give to the arts a status equal to that of science and technology, in education as well as in the culture generally" (38, p. 5).

Is there a resolution of the "conflict" between art and science, between fine art and "useful" art, between the cultivated elite and the vulgar democratic mass, between a culture of refinement and taste and one of sheer productive abundance, between the humane qualities of the human experience and the mechanization of modern life? And if education has a major role in the resolution of these deep-seated separations, could we not begin by demonstrating how technology and the humane can be infused with a common purpose in modern schools that are designed and equipped so that their human employees can stop being overworked machines and spend more time being creative teachers?

Perhaps the antitheses between art and science, and the related cleavages, will never be fully resolved. But our very existence could depend upon a continued and more vigorous effort to make this resolution come true. This, I believe, calls for a true "work of art," one that could represent the most inclusive creative effort of contemporary man.

NOTES

1. From a letter sent by Vincent Lanier to the media specialists: "A Statement on Art Education for the Media Specialists."
2. Randall Harrison's research in "pictic analysis," (involving analysis of facial expressions) is based, somewhat, upon the work of Ray L. Birdwhistle in the development of an annotation system for the analysis of body motion and gesture, which he has named "kinesics."

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Symposium Statements:

PANEL DISCUSSION

Leslie Greenhill: Welcome to the Wednesday morning panel session, ladies and gentlemen. On my left you will recognize the resource people in instructional media who already have presented papers to you, Ray Carpenter, Jim Finn, Bill Allen and Ken Norberg, and on my right we have Herb Burgart from George Peabody Institute, Ken Beittel from Penn State University, Elliot Eisner from Stanford and Manuel Barkan from Ohio State. These men are representing the art educators.

The purpose of this morning's session is to get you involved in posing problems and questions to any of the members of the panel. There may be questions about use of media, or a discussion of concepts in art education and how the use of media might be used to facilitate the communication or the learning of these concepts. We hope this will provide you with an opportunity to bridge certain gaps that may be apparent in what developed in the last two days and to serve as a further foundation for the position papers which the various groups will be called upon to develop tomorrow and to present on Friday. The panel is now open for questions, comments and discussion.

Barkan: Rather than ask a question, I'd like to comment on one or two items that seem to require clarification at least in so far as I try to think about media, whether you call them new or old. I think when the term medium is considered in the field of art education, as compared to other substantive or other subject matter fields, it needs a special kind of clarification, precisely because the historical concern for media in art education has been largely in terms of media for production, that is for the producing or making of works of art. Now, I take it, that at this symposium we will be talking about media largely as instructional media, rather than as media for use in the making of the works of art. I am not implying here, nor am I confusing the possibility that a given medium can on the one hand be an instructional medium and on the other hand a medium for the making of works of art. I would say, however, that depending upon how one looked at that medium, if one viewed it as a potential instructional medium then it's a different kind of an animal and it needs to be conceived of in a different manner than if it is viewed as a medium for either artist or student to use.

It seems to me quite essential to make the distinction at least significantly sharper than I've heard it made in a good many of the discussions so far. My own interest at the moment is less in media for use in the making of works of art than in instructional media. I think we have more media than we know what to do with and the trouble with the quantity of media is that we haven't really applied the kind of conceptual controls for the selection and utilization let's say, of media for youngsters or students we are working with to use for whatever purposes we intend. The speakers have been saying both explicitly and implicitly, that if we're to attempt to find ways of utilizing the instructional media that you have been describing that one of the conditions that it presupposes is a regularization of objectives because without such a regularization of objectives we would be playing around with instructional media in a relatively unproductive manner. There has been too much such playing around with the studio kind of media in the field of art education and I simply want to suggest that at minimum it seems to me there is agreement on purposes in the field of art education. If there isn't, I think there ought to be.

There are at least two key purposes among whatever variations of purposes individual persons or individual groups of persons might choose to adhere to. One purpose in instruction in art is to encourage the diversity of perception, diversity of expression, diversity of understandings of meanings on the part of individuals, and it seems to me that another purpose is to bring students to understand, to be able to perceive, to be able to appreciate, if you will, the diversity of realities that the history of art and the range of individual artists have demonstrated through their works. If we would take only those two objectives as minimal objectives, it ought to be possible to utilize, to conceive of possible ways of utilizing the media, toward achieving some of those objectives more directly. I think, to do so however, would require going back to what I tried to indicate at the outset. Becoming clear and quite sharp is the distinction between a medium as an expressive medium as compared to a medium as an instructional medium. The reason why I make this kind of comment is that when I view some of the films it seems to me that they failed to make this kind of a distinction and did not really carry the kind of instructional message that they are intended to. Instead of being an instructional medium, they tended to become an art form in themselves.

Greenhill: I think the question that Manuel has raised is a very common one with people from two diverse disciplines. They use the same words, but with different meanings and I judge that one of the problems here is the use of the word medium which is used in one way by people in the field of art and a different way by people in the instructional media field. I'd better ask the people on the left here if they would care to comment on what they mean by the use of the word medium and then we'll get to the second part of your question, Manuel, about the matter of stimulating diversity of behavior patterns.

Allen: I think we in the instructional media field tend to use the term media rather loosely and I know I use it interchangeably for what Ray Carpenter refers to as the modes or the carriers of information and I think one of the distinctions he has made is worth looking at.

Greenhill: Would you care to restate your distinction, Ray, between media and modes of communication?

Carpenter: I believe that this problem arises because of the reference to such equipment systems as television, as "the medium" of television. When we refer to television as a medium we are including a great many different components of a complex electronic communication system. And, the other error is to ascribe effects to a medium when it is not the medium that is actually producing the effects. Rather it is what is being channeled through the medium. It is what the medium is carrying. I find it useful in my own thinking to conceive of these media as essentially blank sheets until we put content into them, until we organize the message, until the channels are filled with significant and organized information. It is helpful to me to make three distinctions. The medium is the carrier of the information. The second is the mode. I think we can make a contribution by sharpening the definition of what we mean by the *modes of communication.* The third level of concept or conceptualization that is helpful to me, is the processes that operate in the mode. Assume that we have sound, and that sound is in the mode of speech, and that the speech is meaningful speech, then what are the kinds of meanings or kinds of organization of conceptual system. These are the three kinds of definitions that are useful for me.

Norberg: Just continuing a bit from what Ray has just said, several of us have made comments to the effect that there really isn't a science of audio-visual communication. I think this statement, when it is made is usually based upon the fact that although we've had a great deal of media research, we have not had sufficient research into modes of communication which have to do, as I understand it, with the psychological characteristics of the stimulus material that is being transmitted by the medium. Now, this is not to say that the media research has not been useful because this does tell us that, for instance, films and television and other media can be used successfully for instructional purposes. I think another point worth making here is that while "the medium" is not a very precise term, that media do have characteristics. McLuhan has emphasized this with his well known statement that the medium is the message which I think is an exaggeration, but it does suggest that the medium has characteristics and that the media set certain limits to what you can do. It even suggests that it invites a certain style of presentation. Perhaps, you do certain things with television that you do not do with film because there is a difference between these two media and the style and the presentation that they suggest or that they invite.

Allen: I think it might be useful to pick an example. We've been around Robin Hood's barn here about a definition. Now, for example, I would consider a so-called pictorial representation or a pictured representation as a mode and this then, you see, could be carried through several media or through several mediums as Ray Carpenter has stated; through television, through motion picture, through slides, film strips, flat picture, etc. Another type of mode might well be print, which could be carried as books or could be carried under teaching machines, at least the way I see it.

Finn: Do you want to know what I think, Les? I think this discussion is absolutely futile. I don't see why, in the first place, the people in art education can't make a simple distinction between a paint pot and a motion picture someone is using for teaching. I don't see why they get intellectually tangled up in the fact that you might dip a brush in the paint pot and make a chart out of it and somebody could study and learn something from it. What's so mysterious about this? Now at the other end of the scale, my distinguished colleagues here represent the psychological research orientation in which these questions have to be asked, no doubt about it. As you have to, Allen is always trying to figure out relations of sound and pictorial representation and so on and so is Carpenter; so they want very precise definitions of what they're going to do. This is a morass and that's why I say the discussion is futile; it's a morass. Ken just got close to it there. You can talk all you want to about a pictorial representation being a mode and you put it on television and/or film and it's going to be different and McLuhan's concept, for instance, of one medium making the other transparent is inherent in this. In other words, you get a different view of film when it's on television or how the television treats it rather than when, for instance, you go the other way around and film treats television. But actually, why does a practitioner have to get so terrifically involved in these research distinctions, which are very useful when one is making research measurements? I think it is much better to back up and ask some very simple questions about what we are doing. We are doing this: we are applying what we have developed in the field of communications and other kinds of technologies to the problems of instruction and we rely on people like Bill Allen and Ray Carpenter to give us some precise answers as to how we make these moves, and we rely on the art education people to make certain fundamental distinctions, such as what it is you are trying to do in your discipline and then we try to put these together. The problem is in the margin here and you can talk all day about a definition. I can give you an historical analysis of the ways we've tried to define the audio-visual field since approximately 1908 because I did this once and it doesn't make any sense all the way through. They are still wrestling about it. I'll give you one example and then I'll shut-up. The word audio-visual is a contradiction in the English language. I have a theory of how it occurred. It either ought to be audio-video or aural-visual, a-u-r-a-l. It's not the way it is, you see. No, I'll tell you what happened. Originally they had visual education. Then came the sound motion picture and somebody in Bell & Howell said we can't show our films and our projectors using the term visual education where we have sound; so what will we call it: well we called in some engineer and he named it audio-visual. If we had called in a psychiatrist you'd have had aural-visual and so we are stuck with a kind of a technical contradiction to begin with.

Norberg: Well, it's not too late to change it.

Greenhill: Let's get some feedback from the audience now.

Audience: Nobody wants to be first, so maybe I'll be a spokesman for several. I didn't want to theorize, I didn't get the idea from the material that we're going to theorize but that we want to try to take back some information that we can use on these audio-visual materials and new media that could better teach art in the classroom. I agree wholeheartedly with Dr. Finn because you can theorize all day and tomorrow and the next too. This still doesn't make me a better teacher next week in the classroom; so if you gentlemen could give us some means to better use what has already been invented, this is what we'd like.

Greenhill: One of the issues raised by Manuel Barkan that might be worth exploring in this connection is that in most areas of instruction the teacher is concerned with getting students to understand a definable concept—in other words we're trying to teach what we often call convergent behavior, everybody understanding the same set of things, whereas in the field of art, more often than not you're concerned with trying to encourage divergent behavior: everybody producing something different. One of the questions which is frequently raised by people I've talked to here is how do you use media for encouraging or stimulating divergent or different behavior on the part of the individuals exposed to it? Is this a subject in which there is some interest, and if so should we explore it?

Eisner: Let me try to put this into more concrete terms, if I can. One of the problems that teachers of art have is that of introducing projects or problems in a classroom. Any art teacher inevitably has this problem if she is going to teach. One of the general kinds of things that many teachers would like to achieve is not only to have the youngsters produce in such a way so that the aesthetic quality of the product is high, but also that they are diverse. They hope that all of the youngsters don't come up with the same visual solution to a particular kind of an artistic problem whether it's a problem of making a landscape painting, or the problem of making a pot, or the problem of weaving a rug. Now, if teachers have the concern of introducing artistic problems to youngsters in the classroom, they are concerned with not only high level aesthetic solutions, but also solutions in the class which are diverse, which are versatile, which have a great deal of variability. Then the problem becomes one of how audio-visual media can in their modes be used to stimulate both diversity and high level aesthetic solutions. Perhaps this brings it down more to a practical basis: what can we do with media to create this kind of situation and stimulation?

Greenhill: Could you add one more step to your question, that is what do you now do without the use of audio-visual media?

Eisner: There are many things that teachers do, different sorts of things. One of the things that teachers do is to talk with the students about what they might do or help them recall experiences that they've had. Sometimes, they show them examples of work that is already completed in that particular area that they are investigating.

Norberg: This question was considered briefly by some of us when we were planning this discussion and the point was brought out that perhaps the mistake sometimes made is to show students an example which then immediately becomes a kind of uniform response on the part of the different members of the class. The idea was suggested that you might play around with a film or with a filmstrip or even with a set of slides which show a number of different ways, or suggest a number of different ways in which a particular subject could be treated.

I'm reminded here that there is a film that I saw recently and some of you may have seen, called "Four Artists Paint a Tree." How many of you have seen this film? I see one or two of you have. I don't know whether the film is really an ideal solution to this problem or not, but it is an interesting approach because it deals with four artists from the Disney Studio and first it shows how these artists work together as a team under the conditions of commercial art, where each man has to modify his style or adapt his style to a kind of a group conception of what they want to produce. Then they take these four artists out into the countryside and each of them sits down and paints the same tree and in the film each artist discourses on what he feels about this tree and how he is trying to deal with it, one man, for instance, is dealing with it as a problem in architectural structure and another one thinks of it primarily as a living form and finally you can see the four results, which show in a rather striking way how four different artists can paint the same tree. This suggests one possible application of media to this particular problem.

Carpenter: I might suggest a couple of very general conclusions that have resulted from the research programs on this problem of variability. Usually when you have a problem that has been judged to be appropriate for the production of a film, the idea is: let's produce *a* film! Growing out of our research techniques of producing as many as 28 versions of the same film in order to find out what is operating in that film, is the suggestion that we often need many versions of a film on the same subject. As we move to use the film medium, particularly, do not suggest that *a* film, is going to be the solution to a problem. It is never the solution to any except a very limited problem. The answer will usually require a series of film, dealing with varied aspects of the problem.

Beittel: My first comment is a broad one: it is impossible to separate theory from experimental and practical concerns. To begin with, the issue as posed is over-simplified because diversity from a one shot affair is different from diversity in longitudinal aspects or in learning. I much endorse Carpenter's notion of sheer experimentation, atheoretical or theoretical, at our stage of ignorance. I would doubt whether as practitioners we could agree among ourselves on our goals deeply enough to commit ourselves to a line. And yet, this is what is required in a sense to develop instructional materials. In other words, sheer experimentation maybe is called for at this point, but in terms of experimentation and in terms of some evaluation, because such issues as are raised are not that clear and simple, at least not to me. I may just be overly confused. The other thing is I don't think we need to worry about some of the things the speakers here are worried about. For instance, creativity is not a worry to me. I think people in the arts take for granted among their objectives the issue of creativity, diversity etc. We almost would do better to put it aside and become a little convergent for an experimental procedure. This is a creative idea in art education, to become convergent. Working within restrictions might release a person through sheer monotony. Kept at the same stimulus, he has to vary it, because what else could he do, he would be sick of it. Maybe this is facetious, but it points to a disciplining that the person brings in. At this point I may be confusing the issue, but we actually should converge sufficiently to make a thrust in some depth and in time and ride it out. If it's a failure, it doesn't matter.

Audience: Perhaps I'm the only one experiencing this difficulty, but on the one hand we seem to be engaged in a very broad level of discourse involving the nature of experimentation, involving such generalizations as film, audio-visual devices and so on. I don't know how we can confront the critical questions or the value questions so long as we deal with such generalizations. On the other hand, we have been experiencing a number of efforts in the area of film making. I expect that we have seen about a dozen examples of efforts in the field. It occurs to me that we might profitably turn to the original question of the utilization or the judgments of any one or any grouping of films that we have seen.

As a personal argument many times we read works of our critics, where in discussing and in attempting to evaluate works of art, we get caught up in "soupy ground" of aesthetics discourse, and many of those called upon for criticism will say, let's look at the objects, let's confront the objects and see in what kind of disciplined way we can bring our critical judgment to bear on them. In a sense I would like to invite any of the panel to confront any of the films we have seen thus far, in an attempt to discuss the implications, the qualitative considerations, the experimental findings that would provide more insight into the artifacts or the audio-visual efforts that we observed thus individual artistic capacities in all the different media. The problem of media in the classroom is what can the teacher do in the class to bring John to more of a realization that he has the capacity to generate different solutions. I think one way is to show far. It seems to me that we have separations in our program. On the one hand there have been attempts to provide philosophical-theoretical background for the work in the field. On the other hand, we've been looking at a lot of films and what I would like to invite is an attempt to bridge the points on this continuum.

Audience: I would just like to say that if you are looking critically at a work of art you had better savor the soup of aesthetic theory if you want to know what to look for. (laughter)

Audience: Speaking of divergence and convergence, one way to get divergence is to help individual children develop their own him and the other is to generate it. I think the other way that was suggested was to increase possibly the chances of John's coming to this realization by approaching him on a number of different levels with a number of different media, some perhaps being very concrete objects. Frequently the teacher doesn't know on what level John really responds. As a matter of fact, John may have to discover that himself. You find a lot of children who sit around in elementary schools, not necessarily in art but in other subjects too, most of the year and are poor students because the media they use do not add up. When they are given an opportunity tc make a visual response like picking one object out of ten or painting something or copying it or showing that object A goes better with object B than it does with any other object, then all of a sudden the child finds that he has a capacity to respond and the teacher and he both get excited.

Finn: May I ask a question of the art people here. Looking at this from the point of view of the music field, there is a skill element here and I'm not sure, having attempted to understand some of the very modern art, whether any skill other than knowing how to make optical illusions is necessarily involved. But I assume there is. Do you people feel that there has to be a certain amount of skill before a child can at a given level of development be creative? I couldn't play the trombone creatively which I never was able to do anyway, but I couldn't until I knew how to play the trombone. Now, this was pretty crucial. If this gentleman who spoke went back to objectives, (I'm not trying to get behavioral about this), there are these levels. In other words, can somebody at a given level of maturation be creative or can he see several ways before he has certain kinds of skill? If this is true, and you can define certain things you want to do, then I think we can give you some direct answers. I can think of a lot of ways that you can get at some of these things if we had some kind of an order or priority, but if you just say you want these people to be whatever it is you want them to be, it is a litle bit hard to do.

I assume, for instance that one of the skills involved in art is in the ability to see the world perhaps differently than other people see it. Hoyt Sherman at Ohio State experimented with this problem years ago. He used a tachistiscope, which I suppose many of you know. Today if that is a skill, then you can define it and then somebody can suggest several ways to get at it. There are various ways you can develop a skill simply of looking at the world differently. That process, if it is handling tools, or knowing how much water to put in some other kind of medium, has this to occur first before you can be creative? Maybe it doesn't, I don't know. Do you have some kind of priority or do you have a horseback guess as to how these things happen. Can you tell us this? I graduated from high school long enough ago to have a physics teacher who tried to convince us that space was an absence of everything and since I have come here I have heard some say science and art are not closely related and that this is our problem. But science now says that space has something everywhere and so I'd say I believe as an artist that you can't create something out of nothing. First of all you have to have the fundamentals. It seems that this is where media will do us the most good.

Audience: I want to talk to a given point and see if there is some discussion, divergent or convergent. I think, as did the gentleman who just spoke, that we've got to start with the individual and have this individual be himself, and if that means that we're going to have ten individuals we will have divergence because of the way human beings are made. If we are talking about the mechanics or skills, we have got to start with the individual and let the individual be himself, to speak of himself with particular methods or particular media, or particular tools. He goes and gets them because he needs them. What we forget is that we want to play the piano, for example, as an individual who needs that experience.

Audience: It occurs to me that the person who plays the piano may not be a musician, he may be a technician, he may set up certain standards which in the performance of music use different things which do not depend on the keys, but on the rhythm. He may be a technician and he may set up certain standards which give you this end product, but this has very little to do with the sense of what music is, other than the skills to make noises with instruments on somebody else's pattern of organization, the composer's. I think we have the painter who tends to be the composer and performer in one spontaneous act so that this sets up quite a different kind of process. Also, it seems to me that you can make the assumption that before anybody can be an art performer, he must have acquired certain skills. Nobody can play football until they get checked out on all kinds of things making them ball players on their own level, which may be the crudest level.

Finn: But, look I just asked a question, I didn't take a position on it and I gathered you are all confused about it. You really can't answer it.

Eisner: No, I think we can. I'd like to respond to what was said. It seems to me that, take football, for example, the training of the individual is precisely what is done at, for example, high school level, the college level, and in professional football. The "creative football player" operating at high level of performance generally has learned either informally or formally a certain array of skills that he applies in his craft in playing this game. Now, it seems to me that we can identify an array of skills in the productive aspects of art education that students ought to learn and that will enable them to deal more adequately and "creatively" with visual problems.

Not all of the learning that goes on in art education need be or ought to be divergent and I didn't mean to imply that when I raised this question of variabiliay. One can't create a novel if one doesn't know how to write. If you watched the film where Levine working on that oil painting, he didn't worry about the kinds of colors he was going to get when he put his brush into burnt sienna and yellow ochre. These skills, if you will, have been overlearned in the same sense that we overlearn the abc's or the multiplication table or spelling, and they free us and they free him to deal creatively with the visual problems because the practical skill issues are no longer problematic.

In a sense, it is when a youngster or an individual has so overlearned certain types of technical problems that he can begin to deal with the aesthetic problem, with the creative problem in art and I think part of our difficulty, part of the problem that we have in our field, in the productive areas especially, is being able to identify the kind of skills that are educationally reasonable for students to learn in the elementary and the secondary school in order for them to deal more adequately with the creative problems and the aesthetic problems in painting. This is a curricular issue, it's a theoretical issue, it's a philosophic issue. What I am saying is that I am disagreeing if I understand you position. I think there are certain kinds of skills that are very reasonable for students to learn if they are going to deal aesthetically and creatively with the productive aspects of drawing, painting, or sculpture.

Allen: There is a confusion here and I think we have so many divergent ideas converging on our problem that I'd like to come back to the question that this gentleman raised in the first place, "how can instructional media people help me in school?" I think this an extremely difficult problem, and in my opinion you are being given very simple answers by your audio-visual people. The answer is primarily based on the availability of material that is on the shelf, so to speak. We've referred to film; this would hold with other materials as well, but the immediate reaction of most audio-visual departments or instructional media departments is to go to the motion-picture film route. Now, the point I tried to make, in a way, was that I feel you have to define what kind of objectives you are after. Now, Finn has mentioned an objective, a very critical one which is the skill development, a specific skill development and I would assume this might be an objective that you would have in some part of your program which is: how do you teach kids to paint with tempera? It could be broken down even further than that. That is one kind.

Another kind of objective has been mentioned which was the development of high aesthetic solutions or feelings or appreciations and, I don't think we could even approach this! I don't think you can even direct yourself to this kind of broad question and the plea I'm making is that we try to define more specifically what we're after, what we want and then try to seek the specific or optimal or the best we can, the kinds of combinations or single types of materials that might accomplish this. I've made the further point that at our stage of development in my part of the field we "ain't" got the answers. We don't know what specific materials are available to meet these particular objectives and it seems to me that this is where some interaction has to take place between the art educators and the instructional media people perhaps.

Carpenter: I believe we have arrived at the stage that we can expect this conference to achieve. Conferences seem never to come up with complete closure or final answers. *A conference like this is the beginning.* It is the fertilization process, and I think we ought to put it in this perspective. The fruits of this conference are going to be harvested much later than 1966 or '67 or '70.

I am reminded of what the engineers expect of psychologists: They expect us to come together with them and in a three day conference and tell them everything about learning. However, if we were to ask the electronic engineer to tell us all about electronic engineering at a three day conference, they would think this absurd. To a certain extent we are in the same kind of a situation here. The need is to learn all there is to know about behavioral sciences, learning theory, and media. These are enormously complex, extensive bodies of information and skill.

It seems to me that getting this longitudinal time perspective in here in relation to what we can expect to accomplish is tremendously important. One final point: We need content people to work in these fields, not just media people. One procedure would be to define problems in art education and ask what media and modes of communication solve this problem. In other words, I think that the initiative, the aggression, the focus of attention ought to be on kids in art classrooms, rather than on motion pictures, television or other media.

Barkan: I think you are quite right in suggesting that this discussion is painful. It seems to me that I caught an undertone in the way in which you said it that you might think that we're making it painful for you. Rather, I think, we are making it painful for oursleves and I think the reason why we are making it painful for ourselves is because, we ourselves have not yet found the ways to come to grips with the problem. I think you are quite right in saying that we have to pose the problem to you, but we do have to pose the problem to you in a manner in which you can in any way help us to handle the problem and this, I don't know whether we are willing, or we as yet have been incapable of doing. Let me illustrate what I mean by an example. If we take seriously what Elliot Eisner said just a few minutes ago, there are things to be learned.

For example, I take it, Elliot, you would agree that there are things for kids to learn or teachers to teach the kids about, let's say, subtleties in the discrimination of color, either in terms of their own control of making subtle discrimination of color, or by way of their capacity, to be able to perceive and recognize and be able to respond to subtleties in the control of color as seen in the works of other persons. OK? Do you agree so far? Now, would you also agree that this does not come naturally? (Eisner: We have more than ample evidence). All right, if we have more than ample evidence that this does not come naturally, then I think we've got to come to grips with the delusion, I would call it, in art education that has guided art education thought and theory during the last decade or two.

If this does not come naturally, then this becomes a particular objective in teaching. That this youngster has potentiality for such learning is quite different from implying that this unfolds from the youngster. Let me press the point one moment further and this is directed to you, Ken. I think that there is a difference and I think thre needs to be a difference between the viewing of the problem from the point of view of the researcher who has to take an open-ended experimental view of the issue in terms of emphasizing the uncertainties and what still needs to be pursued by way of extending understanding; and the teacher or the curriculum designer who works under operational pressures.

Audience: I have a procedural question. It involves an attitude that has interfered with a great many things. I speak as a supervisor and this is a practical problem. I'd like to know what your attitude is on this question. One of the things that involves my teachers' classrooms is the fact that, procedurally speaking, the audio-visual department that I work with has always wanted everything in a central location. My teachers object to having to plan from anywhere from four weeks to six weeks in advance for demands for materials that would enhance the climate in their classrooms.

I have asked for materials to be issued directly through my art room, that certain projectors be purchased and assigned to the room on a continuing basis, and that certain materials taken from the instructional center be kept a period of time and then the teacher will be able to use these materials in a more or less instant call basis. Now all of the attitudes that have been expressed by the audio-visual aids people, in this case, my associates, have been that this is not an accepted practice and that no specific group can ask for special privileges in this class of materials. Now because of the very nature of our work, I have tried to convince them to do something that should answer this problem.

Carpenter: The fundamental question is should we arrange conditions for students of various kinds or adults to interact with stimulus materials and the conditions which produce a particular behavioral effect. We should also look at the design of the buildings in which teachers work. Certainly one of the great inhibiting factors involved in the use of media in art education programs is the kind of buildings that are available for instruction.

May I suggest the possibility that we think of new kinds of spaces in which we work in order to do the things you define as needing to be done. For example, we should think of providing conditions for individuals to work as individuals instead of as groups and the patterns which have been worked out and demonstrated now at Purdue and Penn State and other places, of having these spaces where all of the materials are available for particular kinds of student performances, an area extended and equipped as an individual area through which many individuals flow. The material is set-up so that the student moves from one station to another and does whatever is required in particular planned and tested sequence. This would require a very different kind of a building structure from what I see in most schools or in most colleges and universities.

Finn: Maybe I can explain here. Ray has a very good point, but we live on a time scale and we are all subject to cultural life and in this case economic theory. Ray is right that in the future, everything in the whole technological system points to as close a contact of student with media as you can invent and this system he is talking about is one way to do this, but the point is that your school district or county or whatever it is you represent, is operating on an economic theory of roughly 1935 which said we have one motion picture projector in the school district and we have to bicycle it around in order to get anybody to use the materials. The whoie idea was centralization in those days.

By the time World War II came along, Hoban and his people had pretty well shown that you have to have a centralized-decentralized system, the object being to get the materials out as far as possible to the school. But in your school administration the business manager will have it in his little head that he's going to control things as best he can by this old centralization process and you're faced with a very practical problem —the teachers can't get the stuff for six or eight weeks. He hasn't even understood the whole philosophy of waste, that it costs a lot less to give you a handfull of filmstrips and let you stick them in your pocket and take them home than it does to catalogue one and keep managing the system. The economic theory of centralization is bad and the administration theory which is an old fashioned power structure doesn't fit either. In the meantime there are certain forces, like NDEA and various others of its type that will gradually and in various different ways help to effect the transition to the thing Ray is talking about. If you have a Title III project and all of a sudden ten overhead projectors come into the high school (I saw this happen a couple of months ago in a school), this justs shoots the whole theory to pieces at once. This energy in the system will do it.

Burgart: One of the historical problems facing art teachers in the schools today goes back to a very practical problem. In the past, as you have already mentioned, not only art teachers but others, have been faced with the fact that not only was equipment not readily available, but it generally took an engineering degree in order to manipulate it effectively. As we have even experienced in this conference, not everything always goes well. Primarily though, this equipment was geared to, as far as the art teacher was concerned, enrichment, supplemental enrichment. We can have a movie brought in and we can look at the movie and we can therefore be enrched in terms of this visual experience. This is a vicarious experience; since we can't go to India, we can bring India into the school room. Now, I am more interested, and I think I speak for some of the people here in the conference, in the productive aspect of media. That is, how can we as teachers, create films, how can we as teachers help children create through these tools? I can't answer these questions without the kinds of research you people have been doing into the potentials or limitations of media.

Carpenter: Let me give you a specific example: Leon (Frankston) up at Penn State, gave little cameras to nursery school kids and with just a minimum of instruction all they had to do was press a little lever. He was interested in what these kids photographed. I can't think of a more exciting experience than this. These nursery school kids, three and a half year olds photographing things! We were talking about what kids see. What they selected to photograph was extremely interesting in Leon's study. This is a simple, almost foolproof way to get media introduced.

Greenhill: I'd like to comment on this, too. I think in most disciplines, we tend to revere and work with the materials of a particular medium and it takes a long time to learn the skills involved. In the field of using the media of the twentieth century, for example the photographic medium, it was very difficult indeed for people to use this unless they were highly proficient and highly skilled. But now, there are cameras, both still and motion picture, which are automatic, which take little technical skill to operate, so that a person can be given one of these cameras and can use it to express his perceptions in a way which wasn't possible just a few years ago. I would like to support the idea that people in the field of art ought to consider photography as a means of recording impressions as something that they can and should encourage their students to work with.

Eisner: May I just try to raise a practical problem; I think Ray has suggested that if we identify some problems maybe this will facilitate our work here. One of the things that schools do in the academic subject areas is more or less systematically evaluate student performance over time and to maintain records of that performance for use by the professional staff. These performance scores are passed on from elementary school to junior high to senior high and they are also transferred out to colleges for assessment purposes. Now, we're concerned with the problems of evaluation of art in schools as well, but we don't have comparable types of evaluation procedure outside of art grades that might be in the cumulative record file. If we were interested in acquiring not a letter as an assessment of performance, but visual equivalents how could we in a school acquire a visual record of a student's performance in painting, in sculpture, in graphics, that could be used to apprise teachers of performance levels of students which would provide a longitudinal record of development, which could provide students with feedback of development of their own performance and growth in this area which they frequently underestimate because they don't recollect the more primitive and less skilled levels at which they were performing in the past and which would serve colleges and universities as an index of high level or moderate level or low level artistic productive performance? How can we efficiently develop a type of record, evaluation procedure, visual data that would give professionals in art education and in education generally a picture of the longitudinal development of individual children and a picture of the productive skill of groups of children in particular schools and in particular school districts? Now this is a practical kind of problem that I think, personally, if solved would provide a very useful tool that we don't now have. Is there anything in the audio-visual area that might help us deal with this problem of acquiring such a visual record of the performance of our students?

Allen: I'll give a very simple answer, but the first thing that pops into my mind, of course, is the polaroid camera. If this is the kind of thing you mean, Elliot, as the visual record of performance, it is certainly possible to take photographs with this or other kinds of film and put these in a continuous cumulative file. This is being done now in some cases in speech development with the tape recorder and you can certainly use the tool of the camera to record art and preserve it as tape is done to record and preserve sound.

Finn: Recent microfilm developments offer possibilities. For instance, the Office of Education is going to have a document service. The price list came out yesterday and you can get a seventeen page document from Bell and Howell, who is the contractor in this case, on microfische which is a little chip of film. Seventeen pages costs you nine cents, including postage. This card is tiny and can be stuck in an envelope. Now color would probably increase this by a factor of perhaps as much as ten, but would cut back with wide use to perhaps twice. There are ways to put microfilm longitudinally on objects like rulers so that you can flip in a chip each year and at the end of twenty years you have a thing about as long as a foot rule and you could just run this through a reader and you could see this longitudinal development immediately. There are many ways to read this and there are ways to print from this microfilm chip electrostatically, in color, by the way. This again is pretty highly experimental, but it can be done and a little pressure in this direction to indicate a little economic demand, and you can have anything you want, and all you'd have to do is to fight for ten years over what kind of records you want to keep.

Carpenter: I think there is another step here. This question is a question of measurement and of necessity this question is exceedingly difficult. It's not going to be solved in a short period of time and it is not going to be solved by amateurs. It must be solved by professionals. This is a field where we have some very highly competent professional organizations to whom you need to take this problem. Educational Testing Service, for example, has responded to the question of how to evaluate English. Art educators could appoach the Educational Testing Service or the American Institute for Research and ask them how to develop procedures for evaluating whatever needs to be evaluated, whatever the objectives are? This is a perfect example of a question that can be asked in thirty seconds but which will require ten years to solve.

Eisner: I don't look at this as a measurement problem, at least not primarily as a measurement problem. You see, you could use longitudinal data and instructional material as a means of providing visual feedback to students concerning their own work in this area. You could use longitudinal data if you have adequate criteria to assess development. That's a different type of a use for it and really I guess I was including both of these sorts of things. My impression, by the way, as far as Educational Testing Service is concerned with respect to this type of material, Ray, is that there are people (I think) in the field of art education who are more sophisticated in the assessment of visual materials probably than the staff at ETS. For example, Ken and people at Penn State have done very subtle and sophisticated work in the assessment of visual materials which go well beyond anything that I've seen that ETS has put out. But, I think that merely providing a means for the visual recording of student performance in the productive area of art and the utilization of that record for students and teachers as visual feedback of such performance would provide a very important service instructionally for art education, and we don't do this now. The work is destroyed or taken home and we don't have those records. This is what I was trying to get at.

Barkan: I can't help being facetious about this and I can't help but agree with X number of persons in the audience who have in one way or another expressed themselves that we are too theoretical rather than practical. I think we're putting our eye on the wrong ball at times. How practical, how operational is a venture such as the one we are talking about? Look, a junior high school teacher has at least five hundred kids. Many a junior high school teacher works with seven hundred kids a week. Now, do you want to give that junior high school teacher the job of photographing the work that the kids are doing? That junior high school teacher can't carry on the operation that she's trying to do right now. It seems to me if we want to use any of these media, we want to find and create the ways, invent the ways of facilitating the work of teachers, not put further burdens upon the efforts of teachers now carrying on. This, by the same token, is by no means a negative response to your emphasis on the need for better evaluation.

Greenhill: I hate to stop a good discussion like this, but the coffee is ready. I'd just like to make two final comments. I think that the first is that the more specifically you state your problem, the more specifically you are apt to get some sort of helpful answer; the more general and ambiguously you state your problem, the more general and ambiguous the answer will be. The second is that the resource people here are going to be around for the next couple of days. They have been sitting in on various groups, but if any group would like to have the services of any of the resource people here, I am sure this can be arranged.

GROUP SEMINAR REPORTS

REPORT OF CLASSROOM TEACHERS GROUP

Sister Mary Andre: As a result of our combined considerations and contributions, we offer the following proposals and recommendations:

I. We propose that concrete guidelines and structure for multi-media art-learning areas be formulated and tested. Such an area might conceivably include equipment and materials for:

1. Student self-instruction
2. A variety of single-concept film presentations
3. Easily available technique and process information and instruction
4. Visual presentation of visual concepts
5. Specific factual information
6. Immediate response to particular student needs
7. Individual and specific motivation
8. Repetition of presentation
9. Variation of presentation
10. Diversified examples of specific process or given materials
11. Student self-evaluation
12. Supplying particular interests

Such an area would make possible:

1. Direct teaching of skills and concepts by the most effective means
2. Reinforcement of learning by repeated presentation or by variation
3. Teaching tailored to student needs, interests, and abilities
4. A wider range of teacher operations and availability
5. An "extension" of the teacher's function
6. Freedom for the teacher to exercise a person-to-person (or one-to-one) direction.
7. An increase in the scope of instruction

Such an area could also, ideally, stimulate the teacher to examine traditional content, methods, and objectives, re-evaluating them and revising wherever necessary. It could lead to recognition of the changing role of the teacher in the classroom, to interest in profitable research, and to greatly improved art programs. In addition we feel that the need for a multi-media learning approach area is particularly great in the art situation, since it is probably true that the art teacher—more than any other—is expected to work (and indeed must work) on a one-to-one basis. This approach can make that expectation a practical reality.

II. We recommend that on the college and university levels, the art-education courses be re-evaluated and revised to provide instruction for the student teacher by means of the media available. The actual use of these media in these courses as vehicles of instruction would be more effective than separate AV courses which would only add to the burden of what is already required and would certainly be less relevant. (We tend to teach as we have been taught.)

III. We recommend that summer workshops or institutes be planned and made available for the purpose of bringing together the technologists and the art educators on an operational level where, through mutual assistance, the range, variety, and application of machines and learning media can be explored and evaluated in terms of the needs, objectives, content, and range of art education. In this matter we foresee particular need for adequate preparation of both the content and the personnel of such an institute.

IV. We suggest that, in cooperation with educators in areas other than art, a study be made of the possibility of broadening the scope of art education by means of the available media in terms of presenting it to the non-art student in the school situation.

REPORT OF SUPERVISORS GROUP

Albert Hurwitz: The supervisors group in its first three meetings, progressed to stages which could only be described in terms of self expressive therapy shot through with honest confusion. After the personal introductions came numerous discussions regarding professional needs and problems until eventually we were ready to explore cautiously each of the four papers presented. Ultimately, we had no recourse, but to search for a definite sense of structure. Certain general concerns began to evidence themselves. These were in turn organized into a series of suggestions and beliefs. We felt that these could possibly provide the basis for new directions in the area of instructional media as it might apply to our own individual school systems.

It was felt that one aspect of the problem of dissemination could be served by our providing local boards of education and school administrators with some suggestions representing not only the consensus of the supervisors' group, but of the media specialists and indeed the entire personnel involved in this conference. Many of these positions are action oriented and we are fully aware of the implications of this, and that to be fully effective they must be related to established goals in art education. Indeed any media must be assessed eventually in light of the framework of sound curricular objectives, which brings us to the kind of statement that the entire group wanted to make as to what is really the main subject of the conference.

Our focus should be on today's child. That individual, who will in his lifetime face an increasingly complex world, prone to rapid change. It is imperative today that educators in our time realistically attend to the complexity of the society within which our youngsters will be expected to function. Our nation, in fact, the world, has changed from a communal to a mass societal structure. Concepts of the family unit, of vocational measure, personal community responsibility, and a man's potential as a creative fully functioning being have also undergone a change. All of this has implications for restructuring our schools, necessitating in many cases total changes within them and effecting such diverse elements as staff, physical plant, curriculum, scheduling, budget, and community involvements. The role of newer media in this learning situation is natural and implicit. Multimedia must serve multi needs. The role of the art educator in this learning situation presents an inevitable parallel. Art educators must, therefore, serve multi needs. The underlying intent of our proposals is to serve the child as a complex problem solver in an emerging complex society. We, therefore, propose that school plants be designed to reinforce inter-relationships between traditionally isolated subject areas, that emphasis be put on such things as cooperative teaching and teacher-for learning be flexible, child centered and pupil team arrangements, that the climate non-graded.

The aforementioned proposals need to be implemented by a multiplicity of media appropriate to serve a variety of needs as they arise. We need rooms that are designed to encourage experimentation as well as to provide adequate space for studio production and appreciation needs. These should include facilities for working with sound, kinesthetics, language, drama, music and the dance. They should provide a range of opportunity for the child to work through all of his senses from the tactile to the olefactory.

As to dissemination of this conference, we suggest that the proceedings of this conference be directed as intensively as possible to all organizations within the educational community as well as to our own membership. In addition to communications through conventional channels such as professional periodicals, newsletters etc., serious consideration be given to the production of the visual statement designed to state the ideas generated by this meeting. We, in turn pledge our efforts to disseminate what we have gained through the means at our disposal, through our contacts with teachers, administrators and the community at large.

The problem of accessibility to both new and traditional media is related to that of decentralization, and as Dr. Finn pointed out, this in turn is also related to outmoded concepts of administrative structure. We recognize at least two distinct approaches here. Within the larger school district, it is recommended that centralized locations be continued and encouraged to display, maintain and distribute those items and equipment that would be best served from a common pool: films, large reproductions, suitcase exhibits and original art works. The need of the individual school center, however, may best be served by having in its own library, small reproductions, slides, filmstrips, adequate library facilities, etc. Until adequate funds can become available for such aids to be set up in each school, art teachers and supervisors should be concerned with preparing acquisition plans for principals and librarians to consider. An appendix to this suggestion offers a sample list of minimal requirements needed to make administrators aware of what today's art teacher needs to make her program more effective.

It has been suggested that the art educator serving in a leadership capacity is herein to be referred to as the art supervisor. We had a little semantic problem at this point as to just what exactly to call ourselves in order to be considered as a working member of a school planning committee, to go beyond the area of consultant. The time has come for all school systems to recognize the unique and indeed pivotal position of the art supervisor as the one person in the school community most capable of welding facilities to architecture, of materials to curriculum and of all of these to the needs of children and their teachers. Our position in planning with the Director of Instructional Media in their budgeting and their purchasing tasks are of equal concern to us.

We endorse Dr. Eisner's suggestion regarding the use of new media devices for the recording of information of students' development in art. While at this time the details of such a proposal are not any clearer in our minds than they are in his, this in no way invalidates the truly exciting possibilities inherent in any idea which can give teachers a fresh view of the child.

We concur with Dr. Allen that instructional media have not been fully utilized as a source of learning activity for students in the art room and many of us will have indeed, to seek ways to educate ourselves before speaking to teachers of the values of new uses of the camera, photographs, or movies in the classrooms, filmstrips, tapes and slides for projects, etc. Art supervisors, in short are interested in means and ends as well as in the subtle processes through which these are absorbed into the wide spectrum of existent educational organizations. While some of these suggestions will not apply to all school systems, others may just provide the wedge to effect the policy change needed at our place in time.

I will now give you a very brief one minute run-down on a series of five projects proposed or put into action which will give you some idea of our supervisors approach to the use of media. I'll begin with myself because I was working on the smallest scale with one school and one teacher and in this instance, we used the making of a film as a part of a self study school project in an elementary school. The art teacher working with students, teachers, principal and members of the PTA worked a full year to do this film. They could not have done it without really examining what they had or what they ought to be having and they had to relate it to goals. They had to do a little research and they found that if the goal said such and such it ought to be considered and if it had previously not been considered, they found themselves considering it and putting it into the film. This was a means to get the teacher and the school community to regard their program with greater objectivity and to bring some new values to the program. So, let us go to Rosemary Beymer who will show you how she used media for an in-service strategy.

Beymer: Having some 1800 elementary classroom teachers in self-contained classrooms, we have a problem of getting our message over to them. Using the closed circuit of the school channel of the Kansas City, Missouri school district, KCSD TV, all city staff meetings have been conducted over this medium, held from 3:15 to 3:45. The staff can receive the telecast in a relaxed atmosphere, viewed in schools by the entire staff or by smaller groups in their own classrooms.

Recently I was scheduled to present the new publication on art education for the elementary grades in six meetings over a period of eight weeks. This way of presenting new material is an extremely valuable device for showing examples of quality, discussing ideas, not wasting too much time getting there and avoiding the problems of parking and all those other problems that teachers have. Since they have many, many pressures during the school day it is a help to have them attend it in a relaxed position. We found it very valuable, and now all our teachers meetings and new reading materials, new curricular materials and so forth are presented this way to the whole staff.

Swider: We have found in supervision, and I am sure most art teachers can confirm the fact that even though a school system might have an audio-visual department where all films and filmstrips are centrally located, our teachers very seldom will take the time or the effort to go to this central place to check out these materials. Our particular plan was to provide a basic art kit for the seventh grade and in starting in this particular grade level to give each teacher a set of slides, filmstrips and the materials that do not necessarily cost a great deal and by letting them have the opportunity of showing these in connection with actual lab projects that each teacher would normally have. To tie in the uses of this material as audio-visual aids, we tried this in one particular course and found that the teachers not only appreciated the particular service, but added to it and created a great interest in using other media in developing their plans for the seventh grade art appreciation course. We found that this, first of all, helped create an understanding of how the basic elements are inter-related, and second, applied the understanding to any work of art approached in this study, and third, it offered these elements to the pupil in the form of a simple lesson plan and facilitated the learning that took place. Recently we've gone from one school and curriculum change on one grade level to cutting across the board to see how instructional media affects a complete school system.

Larkin: This was a saturation attempt to provide enrichment through art to a large city school system with a rather sick art program, still with a temperature, but improving. There were four approaches 1) The sixteen program television series on art appreciation, based on the collection of the St. Louis Art Museum and forms of the city—purpose: to become aware. 2) A twelve minute movie, "Sources of Art," based on the city art museum collections and forms of the city—purpose: to become aware and to help the child to see relationships in these environments to art. 3) Experimentation in eight millimeter cartridge film loop learning, primarily to relieve teacher load and to teach single concepts. 4) Experimental project "Pak-a-Pic." Thirty to thirty-five large reproductions of art from the cave to modern times, placed in seven schools in the libraries to be checked out for two weeks by children; reproductions are dry mounted, sprayed with plastic and bound; information about the artist researched by an art historian and written in language children can understand. Large canvas bags, government surplus, were provided for the children to carry pictures to and from the home—purpose: to get art into homes where not even a newspaper exists. Art, carefully selected and framed, is placed in each new St. Louis school, approximately one thousand dollars per school and it is slipped in under the furniture budget. We now call it furnishings. Thirty-five older St. Louis schools have new framed art collections purchased through PTA funds or school incidental funds. Attendance at the St. Louis City Art Museum by public school children has grown from two thousand five years ago to thirty-five thousand as of this year on a regular basis. Outlook: slow but hopeful.

Hurwitz: These four reports represent projects that are in action now. For the final one, we are going to allow our imaginations to soar and we will dream awhile with Jeanne Palmer.

Palmer: Our project might best be introduced by a quotation credited to Dr. Walter Stone, former director of Educational Media Branch in the U. S. Office of Education. "Too many students, too few teachers, inadequate buildings, too much to be learned in too short a time." This is the crisis that has encouraged the development of new instructional methods and materials which enable students at all levels to assume more responsibility for their own learning. We simply do not have adequate centers for preview housing or the use of modern learning resources. If you have been caught up in this problem, even trying to work in the field of humanities, you can join spiritually with a University of California art educator, Dr. Mark Luca, an architect, an anthropologist who was also an editor of the Golden Book Encyclopedia, and myself as a public school art supervisor, as we face this composite problem within the humanities and looked upon art as the bridge between the humanities and the sciences.

The following dream developed. We are very hopeful that at the local school level and at the county level and certainly at the regional level, we can develop ways to improve the understanding and teaching of man's cultural history through the use of extensive resource materials, imaginative instructional methods and the most advanced technology. The emphasis will be on the arts and humanities, such as art, architecture, literature, music, theater, the dance, history, anthropology, religion, history of science and on inter-disciplinary relationships. The ultimate goal is innovative instructional programs to show the inter-relation of time and space in the growth and development of human cultures. We wish to utilize scientifically designed envoronment where learning will include architecturally integrated displays, auto-instructional devices, information retrieval systems and program techniques in combination. To put it simply, wouldn't it be exciting if we could stand in a certain time, in a certain place in the world and be able to reach out and touch the electronic devices that could bring into focus for us the interrelationships of the music, the art, the history, the whole total program for that period of time and space.

We would also like to have the individual or groups be able to move in time around the world to do comparative study in that element of time. We would also like to have them be able to follow in space on a continental area, the cultural patterns as they developed through time. So, under one roof, we are envisioning comprehensive reference data and resource collections, advanced teaching aids and educational exhibits for inquiry training and learner participation which will be coordinated by competitive programmers and operated with imagination and responsible concern for understanding and enjoyment in the learning process. Innovative demonstrations will employ multi-projections, sound accompaniments in closed circuit television to offer curriculum related enrichment programs for elementary and secondary schools and the college level. Information and materials gathered, techniques explored and evaluated, and exemplary demonstrations will be almost exclusively directed towards innovative programs.

REPORT OF
HIGHER EDUCATION GROUP

Jerome Hausman: From the outset, it was clear to the group seminar on Higher Education that discussion of the uses of newer media is more than a matter of logistics. Behind the operational difficulties in using our current technologies are the larger problems of concepts and values that will give direction to the specific programs we undertake. The selection and utilization of educational media (to say nothing of creating new instructional forms) can only take place in relation to the nature of the content of the disciplines we seek to develop.

To speak of higher education, media, and the visual arts is to speak of many things. Our approach to the problems of higher education spanned the broad area of teaching art in colleges, universities, and continuing education programs. By implication, we touched upon problems of elementary and secondary school art education. Our approach to media was carried on in recognition of the diverse possibilities that are now emerging for communicating ideas. The media for transmitting visual and auditory messages have multiplied, what has not grown as dramatically is the capacity to understand and deal with these messages.

Perhaps of greater importance in confronting problems of instructional media and art in higher education is the tremendous change that has and is taking place in the forms of art and conceptions of art education. One has but to look at the growth of art departments and programs across the country as an index of such change. Of even more importance, one has but to look at the greater recognition and awareness of visual forms and structures for embodying human needs and conveying ideas and feelings. The concerns of art programs in higher education touch upon architecture, products, film, and graphic design as well as the studio disciplines of painting, sculpture, printmaking, and the crafts. Art in higher education seeks the development of historical and critical awareness in which art forms serve as the primary referents. The content for teaching draws upon the emerging imagery of today's art as well as the traditions out of which it grows. Whether one is dealing with the art of the past or the present, (whether one is making his own art form or viewing the work of others) the student should be confronted with the task of making qualitative judgments.

With this as general background the group turned to specific presentations describing projects now being contemplated or underway involving the use of media. I will summarize these reports in the sequence in which they were presented:

John Cataldo described a project involving a multi-media visual instrument. Essentially his idea is that of multi-media coordinating studio involving a visual resource library and a composing studio in which images can be brought together and placed in juxtaposition. The project is one that grows out of his work in graphic communications. The purpose of the instrument is to enable students to draw upon a vast store of imagery as a resource for their own creative solutions. Visual information (organized under three major categories: cognitive, what we know; perceptual, what we see; and psychological, what we feel) would be placed in a storage retrieval unit. These images would be drawn from museums and galleries, as well as other sources of visual information (our mass media, photographs, films, etc.). The images would also be categorized within large thematic headings: people at play; death; trees; conflict; celebration; etc. A key problem in the teaching of art is that of helping students to deal with multiple possibilities instead of linear stereotyped solutions. Students need to be helped to see the poetic and imaginative aspects of ideas; they need to learn to tolerate the amiguity of multiple possibiities. What is projected by Cataldo is not an insturment for ready-made answers; rather it suggests an imaginative means for the utilization of our technology toward opening a greater range and variation of possibilities for the student's finding his own solutions.

James Schwalbach's problem presentation could be placed in the context of continuing education of adults in a rural economically deprived area. His presentation gave added emphasis to the critical need for the attention of art educators to the problems of developing taste and standards in relation to the values now operating in small craft industries. Specifically, he is involved with a problem of upgrading the design and production potential for about two thousand people working in a home craft problem. Working over a large geographical area with a very limited staff, he has turned to the utilization of a two-way telephone system and slide viewers as means for communication. Following initial conferences between the designer and the home producer, further exchanges take place through the mailing of slides and other information followed by a telephone conference. This project represents an example of how our technology can be utilized in relation to the pressures of time and the problems of distance. It places emphasis upon certain areas of service that, at one time, were out of our "reach". What lies ahead is the tremendously difficult task of dealing with a relatively naive and unsophisticated (and artistically illiterate) population. Heretofore, this kind of problem could not be tackled because there were few possibilities for professional contact. Doubtless, the developments in closed circuit telecasts, the availability of films, recordings, etc. as well as the utilization of telephone communications will tend to bring our isolated areas closer to the flux of ideas and hopefully improved solutions.

Harry Guillaume's presentation dealt with the exploration of multi-media approaches to large group instruction. He expressed concern for developing an enlarged and enriched visual vocabulary in the arts. Given the enrollment pressures of a state college, the problems of teaching become compounded. In order that we continue to give more individualized instruction (where such instruction is necessary and desirable) it is important that we evaluate and explore possibilities for effective large group instruction to handle the increasing numbers of students. By developing a coordinated grouping of materials—slides, films, recordings and organizing these materials in sequential clusters, Guillaume projected possibilities for the teaching of a number of courses. The project is one in which he is placing emphasis upon the educational advantages of uniqueness in presentation. He is undertaking this project with the expectation that it may be possible to affect more significant changes in attitude and knowledge about the arts through a multi-media approach to teaching.

Leon Frankston's project deals with the utilization of a video tape recorder in working with his student teaching program.

His presentation suggested a range of ideas and considerations made possible by the recorder: 1) Obviously, the opportunity to see oneself (however painful it might be) provides an invaluable point of reference for analyzing one's effectiveness in the classroom. Students working in a classroom situation can "step out of themselves and become observers" of their own behaviors: they can see their students and their actions from another vantage point. 2) The videotape provides opportunities for comparing different "models" of the teacher in relation to particular teaching goals. Thus Frankston is now able to compare different teaching strategies (for example, how two art teachers might approach a discussion of still life painting) : he is also able to analyze and compare differing teaching personalities. The project is one that offers a great potential in projecting and comparing different models of behavior; different ways of acting. It also offers the potential of developing a resource library of video tapes to be used in the education of potential teachers.

David Manzella's project (while placed in the setting of an elementary school) is one that suggests possibilities for art education at all levels. Specifically, he discussed the problem of heightening perceptual awareness through the utilization of photography; in this case, a polaroid camera. The emphasis of his project is that of helping students to see with greater sensitivity and discrimination through utilizing the medium of photography. The working hypotheses behind this study is that the business of isolating and composing with the camera can significantly heighten perceptual awareness. It is also hypothesized that students who are otherwise disinterested in art or concerned with an effeminate image of art will have an eagerness to learn through the use of the photographic medium.

Our last presentation by Norman Boothby dealt with the development of films that seek to encourage an environment for self-discovery. These films are conceived as visual teaching materials that derive from broad concepts about art forms rather than a how-to-do-it orientation. Thus far, the units developed are an Orientation to the Visual Arts—Clay as a Material, Printmaking, Weaving, Sculpture, Painting, and Photography. Each film unit is conceived as part of a total program of modular units so that they can be arranged and sequenced by individual teachers in terms of their needs and purposes. The project, when completed, will total thirty-five units. Overall, Boothby's effort represents a venture in which film making is being undertaken in relation to teaching goals.

Given more time, there could have been more extended discussion of each of the reports made; there could have been opportunities for others in our group to describe the work they are doing.

Overall, the presentations serve as examples of the activities now underway in the area of utilizing instructional media in relation to art education in the area of higher education. There was consensus that we are only at the threshold of new and exciting developments in the utilization of technology to enhance the teaching of art. We would hope that efforts can be undertaken by the National Art Education Association in cooperation with other appropriate agencies in organizing, evaluating, and disseminating information about new films, video tapes, and other programs. Most institutions are limited in the resources that they can bring to bear in innovation programs and conducting research in this field. We would hope that through the efforts of our association means can be found to support such undertaking. One of our members, Leon Frankston, suggested the formation of an *Interdisciplinary Committee on Instructional Technology and Art Education.* This committee would be composed of representatives of the NAEA, the Department of Audio-Visual Instruction, and other appropriate representatives. What we would deem as being most important is that the work initiated and interests stimulated by this conference find some resources for continuation.

REPORT OF RESEARCH GROUP

Robert Paxson: (Speaker played tape recording and showed slides.) This gives you the feeling of the space cell that they were talking about this morning. They say it doesn't work but we have faith in it. The research committee has attempted here to write a report and also to combine some or several media together and we're going to attempt that this morning. It is mandatory that in dealing with effective instructional techniques in art education which would involve media of various kinds, that objectives be determined first, because the instructional continuum is objective, method, evaluation. Method and evaluation are functions of the objective. Neither method nor evaluation have any meaning without objectives. Media must be selected as operationally affecting the achievements of specific objectives. This does not mean that long range goals or objectives are dismissed. For example, we find it highly desirable to learn to develop aesthetic sensibility, but we would find that this particular objective is too complex and extremely difficult to measure.

Since we are speaking of objectives in operational terms, it would be highly essential for us to consider intermediate or specific objectives within the functional sequences of testable hypotheses. Intermediate or specific objectives, in the development of aesthetic sensibilities might be exemplified in terms of the film "Discovering Light and Dark" where the specific objective may be to identify the three specific aspects of lightness and darkness presented in the film. We may infer that a number of successive approximations, utilizing this one example as well as high level objectives, might be necessary to affect the behavioral aspects found in aesthetic sensibility. This process is extremely complex and we should recognize this factor in both research and instructional application. One assumption of the research committee therefore is that instruments and goals are inseparable. The possibility, moreover, must be entertained that several types of instruments may significantly affect the content of learning and furthermore something may be occurring which reverses this condition. The learning process of the child, for example, may require a spiral approach. Further, a concept may need to be presented in different ways as more sophisticated levels are reached, demanding automation of media within the organization of instructional modes.

The committee felt that we need to examine a medium in terms of objective sequences of meaning. Media and intent must be appropriately related, one to the other, and the effect tested upon those who are influenced in the learning episode. Given some specific context to behavioral objectives, aesthetic elements of a medium must be piece scored to be tested in some dynamic way if research is to be meaningful and contribute to future application. Further, we need to consider qualitative as well as quantitative aspects of the medium which affect in some significant way the learning episodes. For example, several versions of the same content may be presented with the notion of multi-variable factor analysis locating relationships existing within a complex sequence of elements, structures and events.

One problem area which appears to lend itself to research in art education and media is concerned with the nature of instruments and their effective uses in visual aesthetic education. Further, we need to consider the nature of instruments and their uses in basic research. Some directions for investigation have been offered by media consultants from the U.S. Office of Education. Art educators would possibly include other areas of investigation. Their point of view needs expansion. The media consultants would include the following: 1) Meaningful verbal learning. Example: to what extent does the concept burden of a film influence learning? 2) Measurement of responses to instructional media. Example: what kinds of overt or covert responses are most appropriate to the eventual objectives. Should responses be reinforced and in what way should they be reinforced? 3) Picture word interaction. Example: how do pictures interfere with art instruction? 4) Sequencing and organization or patterning of instrument which carries content. Example: to what extent does changing the order of information affect learning?

Other considerations made by the committee are: 1) a relationship between the discursive aspects of visual media. For example: in a teaching film should the aesthetic dimension dominate the cognitive aspects? 2) Does evidence of learning exist as a result of producing media? Example: is learning implemented by using a guided discovery method with the student producing his own material? 3) The systems approach to development of media. Example: how can teams of experts, including computer and media specialists with art specialists operate with these new systems? Talking of the team, art specialists may need to consider how important is the use of real objects, models, films, slides, program materials in being implemental in a unified approach to learning at different learning levels in terms of age and possibly cultural deprivation as well as other areas of consideration. 4) The influence of media on the learner. Example: what are the influences and strategies effecting creation and recreation in terms of the work of art when specific media are employed? In terms of this question, you may need to consider the interpretive, repletive, appelative, associative uses of learning, established within the emphasis of media. 5) Instrumentation for multiple versions of media with the same behavioral objectives. Example: what about shorter and longer versions of the same movie? 6) Functions of presence or absence of teacher in presentation of instructional media. Example: should a teacher be present or absent in the presentation of instructional media. 7) Alternatives to large class sizes. Example: information booths, single studios, and a question of other facilities which may be included.

Under the category of research summation the committee stressed the following: 1) There is a need to establish operational vocabulary to let us know the different meanings of the term "medium" as held between art people and media experts. 2) Establishment of a National Media Center using a team of experts in various areas and having art educators involved on the planning and decision levels. Two functions of such a center might be: a) basic research, b) to produce film or other expensive items which require innovative packaging and time. 3) Establishment of regional research centers with a team of experts to act as interpreters of research and provide data from various sources held as part of the regional centers. There should be a provision for mobile art galleries which would be guided by objectives. Further research is needed as to the way to package the various real objects, films, showing processes, programmed learning, teaching machines and other self teaching aids if the mobile unit is to be effective. 4) Rewrite descriptions of those films and find ways to relate them to the behavioral objectives for the ease of the teacher receiving before running or procuring filmstrips or films.

In conclusion, it is the belief of the committee that if the foregoing considerations are given serious attention by media researchers, then the purpose of this conference will have been at least partially fulfilled. That is—to explore as deeply and systematically as possible the efforts of those who teach and of those who learn in the field of the arts. We would also caution that our explorations involve risks of failures and that complete success is rare.

EVALUATION SUMMARY

L. P. Greenhill, Pennsylvania State University

My role as I have interpreted it has been to observe the proceedings of the conference, to keep an eye on the stated objectives and to make suggestions. I have, therefore, acted more as an observer than as a participant, have attended the main sessions and parts of the group meetings, and have met each evening with the planning committee in order to make suggestions. In addition, I have talked with a good number of the individual participants. First, I would like to review my overall impressions of the conference.

Reaction to general format and content

I would classify the general format and content of the conference as "above average".

a) *The papers*: The papers by the media resource people were of high quality and ranged from presentations of theoretical propositions to practical applications of media. However, the emphasis was on general principles rather than the solution of specific problems in art education. In fact, one of the main difficulties of the conference seemed to be in the defining of problems faced by art educators.

b) *The discussion groups*: The discussion groups provided an opportunity for individuals with common interests to discuss the position papers and attempt to translate their meaning and implications into the solutions of problems of concern to art educators.

These groups were slow in getting started, as might be expected, but they quickly came to grips with the problems and possibilities of using media in art education and have come up with some very good recommendations.

One major area of confusion in several of the discussion groups related to the question of "objectives" in art education. Art educators have been accustomed to stating objectives in rather general terms, such as "to develop aesthetic awareness" or "creativity" on the part of children. If you are expecting to change behavior it is going to be necessary for you to define what kinds of behavior you wish to produce. While you may not agree on objectives of art education as a group, you should each spell out for yourselves a set of operational objectives of your own, in terms of what you want your learners to be able to do as a result of participation in your classes.

c) *Films and television*: There was a rich diet of films which relate to art education. Some of these appeared to me to be very good and useful for teaching art history, art appreciation and other forms of perceptual descrimination, as well as a variety of art techniques. Some showed the use of films as a medium of expression or an art form as used by young people. Some of the films were undoubtedly less good.

The value of the film showing might have been enhanced if the authors (some of whom were in the audience) could have stated their purposes and discussed ways in which they have used the films.

It was unfortunate that arrangements could not be made to show most of the television programs that were brought or submitted to the conference. Much exciting work is being done in the field of art education by means of television. It would have been good to see a variety of examples. Perhaps arrangements could have been made with the Washington ETV station to provide videotape playback time at reasonable cost for one evening.

It should be noted in passing that the conference suffered more than its fair share of equipment problems. This was regrettable and may have had an adverse effect on some potential media users.

Reactions to organization of conference

a) *Program arrangements*: The plans for the conference provided for regular meetings of the planning committee each evening so that changes in program could be made if necessary. This plan provided a good measure of flexibility, and certain changes in program were made during the conference.

It is my personal opinion that the conference was too tightly scheduled. Five days and nights of papers and discussion can result in mental indigestion and loss of efficiency. More "breaks" and changes of pace should have been planned, particularly to take advantage of visiting the very rich resources for art education which exist in Washington. The planning committee attempted to correct this situation by giving participants a free afternoon on Wednesday. At least one social event, such as a dinner, might have been planned and there might have been more time available for informal discussions among small groups of participants.

b) *The participants*: The participants came from diverse backgrounds and exemplified a wide range of interests and experience. This was good. People who do not ordinarily have sufficient opportunity to meet and discuss mutual problems had an opportunity of exchanging ideas.

While there seemed to be a good balance between instructional media specialists and art educators, different philosophies and use of terminology sometimes caused difficulties in communications. This is not unusual, and probably represents a typical starting point for such conferences. Follow-up conferences might be confined to groups with more homogeneous interests. For example, the teachers and supervisors seem to be in need of specialized media institutes (such as the NDEA Educational Media Institutes) which will focus on classroom problems and the use of media for dealing with them in practical ways.

The people engaged in preparation of art teachers need some conferences on curriculum analysis and development, and the development and evaluation of instructional media for use in these curricula.

There is also apparently a need for a research seminar during which art educators who are interested in basic research in their field could come together to define problems, formulate hypotheses, and design experiments to test them. I personally was pleased with the ideas and suggestions that came out of the group meetings.

c) *Facilities for conference*: The meeting rooms and the meal facilities in the NEA building were good. The displays of equipment and instructional materials were also quite good. The participants might have had more time to take advantage of the art resources of Washington, D. C. and more use might have been made of representatives from the Federal Government, to explain, for example, the provisions in federal legislation that provide funds to support the development or acquisition of instructional media and equipment for use in art education at various levels.

d) *Post conference evaluation*: I would like to propose that the Project Director undertake a post conference evaluation by contacting the participants a couple of months or so after the conference in order to obtain their views about (a) the strong points of the seminar, (b) how the seminar might have been improved, and (c) what applications of instructional media they have been able to make or plan to make as a result of the conference.

Highlights of the conference

May I conclude my comments by attempting to summarize what seem to me to be the highlights of the conference's deliberations.

a) Instructional media can be usefully employed in many aspects of art education ranging from the teaching of techniques with continuous film loops to the sharpening of perceptual discriminations and the teaching of aesthetic appreciations.

b) The solution of problems in art education requires a team approach in which media specialists and art educators interact and work together.

c) A systems approach to the use of instructional media is needed. This involves the analysis and statement of instructional objectives in terms of desired learner behavior, and the selection of an appropriate pattern of learning experiences including a variety of media and methods of using them in order to achieve the desired objectives. There should be evaluation feedback and revision in order to improve the system. Nonverbal testing methods are available. They should be developed and used where appropriate.

d) Art educators need to sharpen up and define their teaching objectives in terms of what their learners should be able to do as the result of a given art experience or series of experiences.

e) More use could and should be made of motion pictures and still photography as media of crative expression and for improving the perceptual processes of our young people.

f) There is a need for workshops or institutes for art teachers and their supervisors with emphasis on the use of media in art education. Such workshops might be included under the federal program of NDEA Media Institutes.

g) Art educators can contribute towards the development of more effective instructional media because of their knowledge of the principles of visual perception and how to present visual materials in an attractive way to learners. This is needed for many different kinds of instructional media ranging from text books to television.

h) Much research is needed on instructional media in relation to art education. There is a need for a series of research seminars to define the problems. Perhaps a National Art Education and Media Research Center should be established as proposed by Dr. Carpenter, or the needs for research in art education might tie in with the Regional Educational Research Centers now being established in various parts of the nation.

i) Art educators should broaden their overall goals. Because today's children are tommorrow's adults, art educators can make a real contribution toward the development of the great society—a society which may see a major renaissance of the arts in America. Children need to be taught visual literacy so that they see the world around them. This can contribute to the better use of leisure, the relating of art to the home, to dress, and especially to the community. Unfortunately the environments in which we live are often characterized by ugliness resulting from crass commercialism and lack of taste instead of by beauty and order.

I noticed in the rear of this auditorium an art education poster which bears the slogan, "Through art children give form to their imagination." May I suggest that this be revised to read, "Through art children give form to society."

Conclusions and Recommendations:

CONCLUSIONS AND RECOMMENDATIONS

Vincent Lanier, Project Director

Unlike the empirical research study, the conclusions of this project are neither statistical findings, nor, except in the loosest sense, evidence of the plausibility of one or several specific hypotheses. The project was organized, sponsored and funded to examine the impact, both realized and potential, of educational technology on the teaching of art and to disseminate the results of that examination among the profession. In this context, therefore, the conclusions of the project are best stated under the headings of "problems" defined and "recommendations" developed both during the symposium and through other project activities.

The sources of these ideas can be found in the four papers presented to the symposium by the media specialists, the discussions among the symposium participants and their reports, and in the review of these and other materials by the project director. It is appropriate to repeat, therefore, that to some degree this chapter represents the judgment of the author, albeit a carefully considered one. The ideas thus collected will be presented under the headings noted.

PROBLEMS

Technology and art education

If one assumes the position that Man must make use of science and technology as two of the most significant aspects of the culture of today, then the application of educational technology to the area of art education must become a desirable paramount concern of our profession. While many of us in this profession may become or may already be frightened, suspicious, or concerned about the impact of what is, or appears to be, an alien approach to the area of art, there is no possible escape from the influence of technological change. Like automation, nuclear fission and the so-called explosion in population, technology is a fact of existence, as Kenneth Norberg puts it in his paper, "it is there, inextricably woven into our lives." It must be faced, considered intelligently and used for the betterment of human existence. It is of no avail to regret what is; what we should do is to change what is for the better. Art education cannot long remain an integral part of our cultural heritage if it does not accept and employ those means which technological change make appropriate for other types of educational activity. That this is eminently possible can be supported by the information brought together during this project.

However, it is also necessary to temper our enthusiastic embrace of media with caution, particularly since what we as educators think and consequently what we do can influence the lives of young people. The large scale adoption of media as method and as material for the teaching of art will not by itself solve all our problems, as has been emphasized by William Allen in this report. It cannot, for example, decide for us what proportion of the elementary class time in art should be devoted to manipulative or studio activities and how much to historical or critical considerations. Nor can it select the more effective of two alternative sequences in planning an art program for the kindergarten child: to start with an emphasis on the development of perceptual acuity or to start with an over-riding concern for the significant human questions to which the arts address themselves. Problems such as these, of which art education seems to have more than a few, can only be solved by the development of some type of theory and its testing with children, whatever the nature of the test situation or instrumentation. Undoubtedly the use of media can be of help in solving these problems, since media can proliferate both the alternatives we envision and the richness of opportunity within each of the alternatives.

The impact of the machine

A corollary issue for concern, voiced by C.R. Carpenter in his paper is the question about the tendency for machine mediated visual experiences to alter both the character of an aesthetic response and the autonomy of the art teacher. These are unquestionably complex issues and can only be explored at this point rather than even operationally resolved. The first aspect of this general question about the impact of machine mediated visual experience is perhaps the more difficult of the two since it is necessarily concerned with the range of problems of authenticity. Derivative questions include the differences in quality of aesthetic response as between the experience of an original work of art and its reproduction in some mechanical or electronic form. Ultimately the philosophical position from which the question is approached has an influence on the answer achieved. Without being partisan in this area, one can assume a position based on the credibility of a continuum of aesthetic response to artistic stimuli. This type of position provides opportunity for individual hierarchical ordering within the continuum explored.

Nevertheless, the problems derived from the authenticity of the machine mediated image, while central and critical, cannot be approached as if clear options existed between machine mediated art images and the total "natural" experience of viewing the art original. It would seem that our growing technological vigor imposes a vast increase in the frequency of second and third generation images. Reproductions of a piece of sculpture in a magazine, for example, not only are not the image of the art work, but are not even the photograph of that work. They are, indeed, the reproduction of that photograph in the mass medium of the magazine with all the attendant possible loss in authenticity of image.

As media, both those in school use and mass public use, become more widespread and contain more reference to art, more of the students and of the public in general have access to what may be diluted, second or third generation art stimuli. Again, there is no merit in regretting this, nor is there wisdom in denying it. It is simply a fact of contemporary existence and must be faced as such. What we can do, however, is to try to determine its disadvantages for what we conceive to be the proper growth of aesthetic response and attempt to eliminate them. The youngster of nineteenth century America either did not see the Louvre (and the vast majority, of course, did not) or if he did, he saw it for the first time in the original. Today's child can sit in his living room and at a very early age observe the Louvre and some of the art works in it on the frequently poor image vehicle of the television screen. I doubt if anyone would seriously recommend eliminating such television programs. The only reasonable alternative, therefore, is to make up for this disadvantage, if, in fact, there is any detrimental effect, as best we can, or to try to turn it into an advantage.

An instance of this kind of loss may be

the difficulty in experiencing actual scale in a work of art through the machine mediated image. A medieval manuscript measuring some inches in the original can be exaggerated in scale to some feet in the projected slide with the consequent distortion of some of the evocative qualities of that type of art. In contrast, a life size piece of sculpture reduced to a filmstrip projection or an 8½" x 11" reproduction may suffer a considerable loss of impact, in addition to its containment in two dimensional form. One possible technique which can be used to lessen the distortions of scale, though not to eliminate them, of course, is to display the work of art at least once in conjunction with a familiar object. The sculpture can be shown next to the figure of a viewer, the manuscript near a ceramic bowl of flowers.

As to the autonomy of the art teacher within the framework of increased technological influence on art education, there is little doubt that initial advances will promote some curtailment of freedom. Textbooks, curriculum guides or other traditional materials also impose some restraints on the content and methodology of what is taught, though the range of choice is usually so great, that a considerable freedom does exist. The presence of a body of media materials prefabricated, as it were, will initially restrict the art teacher's activity by simply narrowing the range of choice. For example, in teaching design through film, the use of a particular terminology or set of definitions does, in fact, curtail the autonomy of the art teacher by imposing constraints on his verbal and ideological latitude.

However, as the number of media units, that is films, filmstrips, slides, video tapes, etc. increases, the scope of choice will, of course, be far greater. Eventually there should be a span of choice equal to that which presently exists within the field of reproductions of art work or books on art. At that point newer media may not have as strong an impact on the autonomy of the art teacher as they do now.

Perhaps a more critical matter of concern in this area is the problem of the educational and artistic quality of prepared media materials. Just as with textbooks, there are films, slides or programmed learning sequences in art which are educationally ineffectual or even harmful, and others which represent a poor technical quality of reproduction. What can be done to curtail the use of these materials by teachers? One device is to organize some type of evaluation procedure by one or several recognized experts and to disseminate the results of those evaluations as widely as possible. This would be similar to the present system of having a prominent art educator review books on art or art education and publishing his reviews in the journals and magazines of the profession. Much the same kind of procedure is used in some school districts in which committees or assemblies of teachers view films on art and judge their merit for classroom use.

An alternative, but much slower direction of effort, is to encourage each teacher to be his own judge without prompting and to try to develop a large enough educational campaign both pre and in-service, to make teachers aware of appropriate criteria for evaluation. No doubt this process is much too slow to be effective, especially since too few teacher training programs over the nation provide adequate background in media materials as they relate to art. Professional associations can be very helpful here, although it is likely that they do not usually reach the very people who need the most assistance.

Of course, the entire area of teaching materials evaluation is fraught with difficult problems, ethical as well as practical. Most of the producers involved are commercial firms with appreciable sums of money at stake. However, the case of media in the technological sense is essentially no different than that of media in the studio sense, and for the most part the profession seems to have handled its relationships with the latter media producers reasonably well. Part of the answer may lie in cooperation between the media producers and art educators. Where the art educator is involved in or consulted about media being prepared, at least on the planning if not the production level, the result is more likely to be educationally and artistically acceptable than when the commercial firm relies on its own personnel who, quite often, lack sufficient background in either art or art education to be aware of the most recent thinking in these fields. It is a most wholesome sign that many more commercial firms are using the art educator in some way in the production of materials for the schools today than ever before. Needless to say, this is no guarantee of excellence either, but short of a universal and rigid rating list prepared and disseminated by an organization such as NAEA, the devices described above seem to be the most effective and, simultaneously, the least offensive means of keeping the quality of media in the schools at a reasonably high level.

Interdisciplinary problems

The primary disciplines involved in an analysis of the uses of newer media in art education are the behavioral sciences, the fine arts and aesthetics, and audio-visual communications. A significant problem, at least initially, which we face in analysis, is the lack of commonality of language, concept, and purpose among the three disciplinary areas. This is not to say that the specific disciplines remain isolated each within its own corral, but, rather, that the particular jargon and thinking of each field does not easily transfer on the conceptual level and must, in fact, be learned by those in other fields. An obvious and almost facetious example can be found in the meaning of the term "media" itself which has such different connotations for two of the fields involved. Furthermore, it might be suggested that art education and media are essentially interested in promoting substantially different human behavior. Norberg elaborates on at least one phase of this issue when he discusses the relationship of art to pictorial communication.

As Allen asserts in his paper, there seems little doubt at this point that the use of instructional media does enhance learning in cognitive areas. The accumulation of research findings within the audio-visual field, particularly over the last few years, suggests that the employment of the concepts as well as the technology of instructional media can provide massive assistance in cognitive development. On the other hand, the effect of the use of these media on affective development is virtually unknown. We do not, for example, have any knowledge of the kinds of behavioral change which result from aesthetic experience alone, much less from aesthetic experience which is mediated by mechanical or electronic agencies. It might finally be said that we do not understand even on a theoretical, much less empirical level, the relationship between cognitive and affective activity or, indeed, if such a distinction has validity.

Assuming such a distinction, however, the emphasis in educational technology has been and is preponderantly on cognitive behavior rather than on affective considerations. Here the reader must realize that no absolute differentiation is being suggested. It is not that media have no affective aspects nor that art education does not deal with cognitive issues. What is being suggested is that emotive, evocative, aesthetic considerations are not the primary interest in media and that these are some of the central commitments of art education. An example may clarify this problem. The media producer who makes a film for the purpose of inculcating good bicycle riding habits among elementary school children, will, and probably should, be more concerned with the ability of the film to transmit the information contained than with its capacity to arouse an aesthetic response, however one describes the nature of that response. He might even sacrifice a particular sequence or camera device, which is tremendously evocative, and which is precisely what the art educator is seeking, in the interest of delivering the message.

This raises the further question of the influence of aesthetic quality in media on information transfer. While there has been some research on this issue, particularly in the area of films, not enough is known to make any substantive assertion based on empirical evidence. Furthermore, when studies are done on this issue, the problem of the criteria used to measure aesthetic quality is a serious one. In an area in which objective standards are at least difficult if not impossible to assert, aesthetic criteria used in research are automatically questionable. In one sense, of course, it is reasonable to assume that aesthetic considerations can dilute the impact of learned information, since aesthetic quality can be thought of as the non-functional quality of experience in much the manner that Dewey described it. This does, however, reflect a philosophical position and is, therefore, primarily speculative.

The one time in which the differences raised here disappear and a unified approach seems necessary as well as possible, is the media unit (film, television program, slide series, etc.) which is designed specifically to promote aesthetic response. Here the emotive and evocative experience "is" the message. All of the esoterica of present-day media art become relevant and potentially fruitful to explore. While a multitude of other problems develop, the one of purpose, at least recedes.

Whatever the convolutions of the many problems in this area, there seems to be sufficient argument to support the need for some careful examination of the inter-disciplinary relationship between art education and media. In this report, both Carpenter and Norberg plead vigorously for cooperation between the two fields. One can only commend and endorse the idea. However, such concerted effort would be even stronger and more lasting if we recognize and explore the differences in purpose as well as similarities between the two fields.

Conditions for the use of media

It is, or should be, axiomatic that the use of media has impact according to the various conditions of the learning situation; in particular, the characteristics of the learner. The film, slide, or tape is as much subject to differentiated reception by children in a classroom as is the textbook. In this sense, media do not constitute a panacea for the problems of art education, or for any other area in the curriculum. We must still direct the teaching-learning experience towards the individual child in view of the dynamics of the particular situation, both sociologically and psychologically, whether the learning is mediated by filmstrip, television, discussion, textbook or by activity.

Both Carpenter and Allen stress this point heavily. Allen goes on to develop a method for selecting media on the basis of their effectiveness in attaining the learning objectives at hand. The next step might be to add individual differences in learning pattern to the structure. One might then hypothesize that instructional decision making is dependent upon the consideration of three sets of factors: objectives or types of behavioral modification, instructional media (generalizing this to mean all types of instructional activities) and individual patterns of learning. This could be diagrammed in a three dimensional model similar in some ways to Guilford's model for the structure of intelligence. (See Vincent Lanier, "Means and Meaning in Art Education," March 1965 issue of *Art Education.*)

Changes in art education relevant to media

Both the fields of art education and educational media appear to be in a period of critical change in which ambiguous and peripheral identities and purposes are changing into more clearly defined conceptions. To the extent that the two fields are mutually supportive, as was noted above, both can profit from reciprocal and collective study with particular reference to the nature of visual communication, the theoretical as well as practical problems of perception and the development of more effective instructional materials. It might well be, in the long run, that art education has much to offer instructional media from the point of view of a sophistication of research technologies as well as from the standpoint of qualitative improvement where this improvement does not constitute a possible deterrent to cognitive learning.

In suggesting this kind of mutual effort, Norberg indicates that the center of concern might be "the non-verbal, visual-pictorial factor in education." While some aspects of this problem have been explored above, an additional issue of great importance requires consideration. Without referring to the particular transitional problems of the media field, it might be fair to submit that present changes in conceptions about art education are not only of major and fundamental significance to our field, but are very close to the relationship between art education and media.

Without doubt, the most far reaching of these changes is the addition of the historical and critical modes of art activity to what Ralph Smith calls "The image of the pupil as a creative artist." The traditional preoccupation with manipulative art activity in the classroom, both on the elementary and secondary level, tended to concentrate the kinds of learning promoted by the art class to those made possible by what Smith later calls "expressive creation." Because of this restriction, neither historical knowledge nor critical skill (particularly in the sense of verbal concepts), played much of a part in our art educational curricula. As a result, children in our schools, even when they did have some art experiences in the classroom, were less able than they should be to enter into the kind of involvement with art as a viewer that most art educators would support as desirable. Now, with what might be called the principal objectives of art education being transformed, at least in the theory promulgated in the professional literature, a whole new practice in the teaching of art can be visualized, a practice which can have staggering implications for the need for media. For how better can one learn the historical and critical modes of art activity than by looking at and talking about art? And where the original works are not available, how other than by the use of media can we provide art to look at and discuss?

Despite the serious problems of identity and development both fields presently face, therefore, the kind of combined inquiry called for by Carpenter when he suggests a "National Art Education and Media Laboratory," might serve to strengthen the creation of concepts more stable and conducive to growth than those presently governing the operational level of both areas. Once educational technology is recognized for what it probably is, a revolution in curricular and methodological decision making, and art education is recognized as dealing with the inculcation of higher levels of aesthetic visual response, both in making art and looking at it (if that is what our field is all about), then the kind of role played by both areas will be integral to learning rather than supplementary.

Practical problems in the use of media

A practical and serious problem posed by the use of media in the teaching of art stems from the tremendous proliferation of media devices. Assuming that materials in art for each device are available and that the school district in question has a liberal audio-visual budget, the conscientious art teacher may need to use a startling number and variety of media instruments, in order to provide the best of media experiences for his pupils. The record player, tape recorder, 16mm film projector, 8mm film projector and loop film projector, the filmstrip projector, the slide projector, the overhead projector, the opaque projector, the television receiver and the many types of teaching machines, all do or can have valuable words and images for the art classroom. The logistical problems alone of arranging for, bringing in, operating and returning the equipment, to say nothing of the technical skill necessary, no matter how rudimentary, to keep these machines operating smoothly, can discourage the most up to date art teacher.

Further, there are the not infrequent instances of mechanical failure, the slide jammed in the automatic slide projector, the film broken in a motion picture projector, the light source burnt out and the television receiver or teaching machine needing adjustment. These occurrences are, of course, magnified by heavy school use of the equipment.

A whole new set of problems surrounds the area of media materials. Is there a film on West African ivory carving? Where can one find a set of slides on early American pottery? Are there commercially prepared transparencies showing in diagrammatic form the design structure of a Cezanne painting or the dark and light pattern of a Tintoretto? Unfortunately, the sources for such information are many rather than a few, are more often than not incomplete, and become very rapidly outdated. Here, the art teacher who is dedicated to the careful and consistent use of media needs the training of the librarian and the instincts of the doctoral candidate. To compound the problem, questions about the artistic or educational effectiveness of the media unit noted before intrude at this point. Are the slides good quality reproductions of the art works being shown? Is the film one which will stimulate an interest in its subject, or will it provoke an opposite response? Without some form of guidance on these questions, the art teacher's only recourse is to preview every unit to be used, a time-consuming practice at best, though one urgently recommended by most audiovisual textbooks.

Then there are the problems which surround the bringing together of media devices and units at the proper time in order to provide the desired instructional impact. There is not much point to the film on water color painting techniques once the introduction and demonstration of these techniques has been completed. In fact, showing a film or any other media unit which is not relevant to what pupils are studying at the time is neither a correct nor wise use of educational technology. Yet some school districts still have a "film day" during which children view films, regardless of the topic of the film or the subject of their other classroom activities. It is this kind of problem which prompts James Finn to note, in the panel discussion, that it is usually cheaper in the long run and certainly more educationally efficient to distribute media units as far as possible among the teachers who are to use them rather than to create and operate complex administrational systems to house and lend those units. Naturally, with expensive items such as 16mm films or videotapes this cannot be done, but with slides, filmstrips, tapes, loops and transparencies, it can be done.

While all of the above are small practical problems, they are perhaps as significant in their influence on the day by day operational aspect of the schools as some of the larger theoretical issues discussed. They are also far easier to solve, as will be suggested under "Recommendations" next in this chapter.

RECOMMENDATIONS

The recommendations which were generated during this project cover a range from particular practices to comprehensive possible solutions to some of the general problems discussed in the first section of this chapter. Not all of the problems posed are subject to recommended directions of solution, however. Those that are not usually involve areas of knowledge where little or no coherent theory exists, much less a body of hard findings upon which further theory can be developed. Two examples of such issues are the questions revolving about authenticity and affective functioning or learning.

The reader's attention should be directed at this point to the section on group seminar reports. Here can be found an additional number of recommendations, some stated in this fashion and some implicit in the description of media practices found to be successful in specific contexts. The fact that they are not repeated here should not be taken to mean that they are not considered worthy of support either by the project or by art education. They are ommitted simply in the interests of brevity and due to the judgment that an idea is usually best expressed in the words of its originator. On the other hand, some of the recommendations to be voiced now have evolved from or parallel particular statements made during the symposium or brought to the attention of the author during other activities of the project.

Finally, it might be said that some of these recommendations will appear to be familiar and common-sense, while others will seem extremely speculative. All of them, however, share a vividness resulting from the excitement of searching new horizons. Some will be carried out by school districts, universities, or by projects similar to this one. Others will be admired or abused and, in any case, ignored. Any society, even our vast and affluent one, has only limited energy, wealth and skill. This limitation imposes a priority of attempted social improvements. That not all desirable improvements in art education are attempted should not be interpreted as a neglect of art in the schools. What art education needs and should have is its fair share of social energy; neither should it be ignored as not worthwhile as it has in the past, nor should it be overemphasized as the central function of any educational program. It would seem, in the light of our current cultural predilections, that we need have no fear of the latter possibility.

Expanding quantity and quality in media for art

The present extent of media units available to the teacher of art is completely inadequate. Both commercial and non-commercial sources will have to create a reservoir of media and multi-media systems and units from which the art teacher can make educationally defensible selections. As has been mentioned before, this limited availability restricts the autonomy of the art teacher. It also creates the impression that media are not relevant to the teaching of art, since, numerically, media on art, except for slides and printed media such as reproductions and paperback books, are quite small as compared to other subject areas. It might also be said that existing media units in art, (particularly those in the more sophisticated aspects of media such as television, programmed instruction and computer assisted instruction) are fairly primitive, reflecting merely the beginning of the kind of usage of newer media which only a full exploitation can reveal. Thus, our situation is somewhat akin to that of the automobile in the early part of the century. Cumbersome engineering and limited numbers do not suggest the possibilities inherent in large scale adoption of a particular technological advance. One might well paraphrase McLuhan to assert that the revolution in the extensions of human consciousness is already with us. That we are not aware of all of its present implications with reference to the teaching of art is more a matter of numerical and qualitative inadequacy than of feasibility or philosophical incompatibility.

Not only must the quantity of media materials available to the art teacher be greatly expanded, but the quality of what is created must be vastly improved over the present level. This report will indicate a few criteria for improving the quality of media units designed for the teaching of art. These are not presented in order of importance.

a. Visual media units should be made so that they exhibit an awareness of the visual field involved as subject to the same need for careful and imaginative "design" as any traditional art medium. While it is possible that an excess of concern with aesthetic qualities might obscure some of the informational content, the opposite extreme is much like teaching Shakespeare with the help of a tape recording of an actor with a speech impediment. To whatever extent appropriate, the media unit in art itself must be a work of art. Another common illustration is the art class housed in a particularly graceless building, in which the very principles being taught are constantly violated in the visual environment of the pupils. We do not know how much this may hamper the kinds of learnings we wish to promote. It does seem reasonable to assume that there is some harm and, indeed, that the harm may be considerable. This criterion should be applied most particularly to educational film and television.

b. Art media units should display, in some appreciable measure, the most recent thinking in the profession. A structured review of 50 sample videotapes of art "lessons" convinced the author that at the present time this is by no means the case. Too few of these lessons (three to be exact) emphasized a concern for art qualities. Children were directed or cajoled to be experimental, imaginative or "creative," technically proficient in terms of the skills required for a specific technique, and observant and even unthinking or "intuitive." Rarely was there any indication that one can be any or all of these as a means to create significant visual relationships designed to elicit a response which we call aesthetic. Furthermore, almost all of the tapes viewed dealt exclusively with manipulative activities and the few that were historical in intent, were more concerned with sociology than with art. None of the tapes and few other existing units exemplify a critical approach to art even though the importance of this aspect of art education has been stressed, at least as a concept in the literature, for the last three years or more.

c. Media units should be designed with a particular school population in mind. Usually, this is done in existing units with respect to age level, probably due to education's and art education's long concern for developmental and age characteristics. It may well be that it should be done just as readily for disparate groups of pupils, perhaps on the basis of socio-economic background and certainly on the basis of knowledge of art. Of course, more empirical evidence is needed to support this idea, but it is, even now, more than a mere suspicion. If it is true, in the most general terms, that people see visual images differently and that the visual environments of our growing years in part determine those differences among us of what we see, then this concept of needed media differentiation on the basis of social origin should have some credibility. Perhaps of greatest importance in this area is the inability of many art teachers to convince boys and girls today of the superior value of the fine art experience. Part of the problem may well lie in the contemporary blurring of lines of distinction between the "fine" and the "popular" arts, so obvious in the Pop art movement. Certainly another part of the problem is caused by the lack of conceptualization among art educators as to how to move the youngster from his unquestionable preoccupation with a full dosage of the popular arts to some kind of insight into the richness of response possible through the fine arts. Some of the pioneer work being done in this area could effectively be attempted through media.

Developing school facilities for media

A significant step in the direction of better use of media in art education can be taken by the simple, but expensive, expedient of constructing new school facilities with an eye towards the most up to date media practices. To this end supervisory and administrative personnel in the arts on every level can be particularly helpful, by devoting as much care and attention to the media facilities of new instructional space as they do to studio facilities. As in the case of numerical adequacy, the development of appropriate physical facilities for media is absolutely essential for any thorough exploitation of the role of media in the teaching of art. To have to wheel in a filmstrip projector on a cart and set up a folding screen in front of the room in order to show 24 frames is to deny the uses of media a fair test in the classroom situation.

The innovative possibilities which arise from the rebuilding of school plants for the use of newer media should be exciting to art educators. With reference to the organization of pupil time, grouping and curriculum relationships, changes in the physical dispositions of education provide a new flexibility. In addition to the traditional studio class of 25-35 pupils, the art teacher, with these newer facilities can arrange pupil activity from individual study to combined class viewing of projected media. This is not to say that there is any necessary merit to these arrangements in themselves. They can provide superior learning situations when they are used with a particular end in view. A television presentation should be shown to combined classes of seventh grade art when that program is the best method for promoting the desired learning, and not simply because the videotape and the facilities exist. When used properly and housed in a smoothly operating physical plant, the newer media provide the art teacher with a full orchestra of techniques with which to achieve his ends. But like an orchestra, media can only present or intensify or expand an already prepared pattern.

Establishing interdisciplinary efforts

With respect to the problem of interdisciplinary relationships between art education and educational technology, it would seem that both groups, at least as these groups were represented in this project, consider some form of exchange highly desirable. There is no lack of media people who are sensitive to and knowledgeable about the visual arts as well as art education people who are proficient in and responsive to media. There are also, as has been noted before, a sufficient number of issues within which common questions arise and where some kind of collective inquiry or, at the very least, communication between the two groups, would be of mutual benefit. While it is difficult to conceive of such an interdisciplinary work situation outside of a well supported research endeavor, the idea of exchange of information is an easy first step. It can be recommended here, for example, that art educators with an interest in media read *AV Communication Review*, published quarterly by the Department of Audio-Visual Instruction of the National Education Association. Conversely, media people should be encouraged to read *Studies in Art Education*, as the comparable publication in our field.

A further specific recommendation which can be made in this report is the establishment of an ad hoc committee on media as part of the structure of NAEA. The function of such a group would be, minimally, to collect and disseminate information on newer media as they relate to the teaching of art and in that sense to build on the start made by this project. Such a group might well include some representatives of the media field in addition to art educators, and might serve as a basic liaison agency through which problems requiring mutual efforts might be identified and, perhaps, even studied.

Organizing a media center for the arts

To go one large step beyond the organization of such a group, a measure vital to the entire issue of the uses of newer media in art education is the establishment of some form of repository or reference center. Even now, and most certainly in years to come when the number of media units grows to what may well be a vast one, the need for easily and quickly accessible media information is indeed acute. To some extent, efforts such as NAEA publications: *Films on Art*, *Slides & Filmstrips on Art*, and *Printed Materials On Art*, prepared by the Uses of Newer Media Project supply this need for media information. Unfortunately, published listings are often outdated by the date of publication, require frequent revision, and do not provide as easy accessibility as our most modern technological methods for data processing.

The ideal and not extravagant solution to this problem would be to store the needed data, namely, titles, prices, sources, etc. of the media units, in an appropriate data storage and retrieval system and to provide for a manned or automated, telephone or teletype or postal inquiry and response system for teacher use. As elaborate as this may sound, the technology is relatively simple and inexpensive in the light of potential educational benefits. An additional feature of such a repository might be its use for evaluation of and research with media if the media units were to be held in a repository center. A fully developed center in which devices and units themselves were housed would not only carry on the functions of collection of data on media, dissemination of media information and serve as a reference source for questions about media, but could also initiate or implement programs of media evaluation, development of particular media units and could provide teacher training in the uses of media. These six functions would of course, necessitate a considerable expenditure and go well beyond the financial capability of universities, school districts or professional organizations. The only agency which could support such an establishment would be the foundations or the federal government. However, the first three functions alone could conceivably be operated by the

NAEA, or by a consortium of professional associations in the arts, if the reference center were to include the arts and humanities.

In any case, whatever its scope, some basic reference agency would appear to be essential to the proper use of media in art education. Also, in this instance the factor of time seems to be of some importance. The establishment of even a minimum function reference center will be far simpler and less costly within the next few years than it undoubtedly would be five to ten years from now, given the maintenance of the present rate of growth in media relating to art.

Relating implications of programmed learning

While the theory and practice of programmed instruction does not at first glance appear to be fruitful as a technique for art teaching, careful study and experimentation may well reveal some significant implications. Even now some of the language and concepts of programmed learning such as the terms "behavioral modification" or "reinforcement" appear in art education literature and constitute a sharpening of our verbal self-analysis. The development of programmed learning sequences for art education has already begun on a modest scale and will probably expand vigorously during the next few years. Certainly as our emphasis in art education transcends the solely manipulative and begins to include historical and critical activities, the relevance of programming will become clearer and more immediate.

However, rather than the programs themselves, it may be concepts of programmed learning which may be of greatest benefit to the field. A fundamental conception with such significant implications is the need for describing the ends of the learning process with precision. Since programmed instruction has a built-in bias towards measurement of results (in fact, the teaching machine idea grew out of primitive testing machines), the ends to be achieved by the pupil must be stated so that they can be measured. Thus, to use the teaching of art as an illustrative ground, the end of "developing an awareness of art" or "promoting creativity" is simply an inadequate description of the desired outcome. What programmed learning requires is a specific and if possible measurable description of the change in pupil behavior desired.

While this may well be a healthy requirement for art education, it does raise some notable problems. Within the domains of historical knowledge and studio skill, we can describe the ends we seek with some facility. Even creativity in art can be catalogued by specifying its component behaviors, as far as we know them. How do we fare, however, with an end such as awareness or the ability to respond to visual aesthetic stimuli? It may be that some day one or a battery of psychological or physiological devices (perhaps heart rate, GSR, eye movements or pupil dilation), may provide indices of appreciation. Or we might assess non-discursive behavior such as self-motitivated visits to art museums, books on art checked out of libraries, or even art reproductions selected and displayed in the home. At the moment our most usable behavioral index would appear to be verbal behavior; what the pupil says he knows, thinks and feels about art, as unreliable as that may be. At least verbal behavior can be measured, as gross and inaccurate as our calibrations undoubtedly are. Some sense of the extent to which our teaching inculcates an habitual excitment in the presence of visual phenomena with aesthetic quality would be most gratifying and many in art education are coming to believe that this kind of response is the most important potential outcome of our efforts.

Thus, despite the problems raised by requiring greater precision in the description of the ends of instruction, the tendency towards clearer thought and more dependable language necessitated by this requirement can be most wholesome for art education. Within the realm of programming itself, the advantages should be obvious. As an individual study technique, programmed learning can do much to equalize disparaties in cultural level among pupils. What one or several children in a class do not know can be assigned as individual study without this lack of information acting as a brake to the activities of the remainder of the group. As a means of pumping sturdy doses of factual knowledge into groups of people, it is probably more effective than any other technique we now use. More than this, programmed learning may be able, in the long run, to free the teacher from the burdensome need to personally transmit massive amounts of information to large groups of pupils, with all the attendant wastage of time, effort and expense. In effect, once a class knows the relevant data about Impressionism, for example, the more significant question of its consequences for future painting can be examined by teacher and class together. The intriguing speculation of what painting might have been had there been no Impressionist movement, for example, is a more worthwhile exercise for teacher-class time than the facts about the style themselves, if machines or written program sequences can successfully transmit the latter materials.

Recognizing the photographic arts

Another major recommendation, is for art educators to support the recognition of photography as a form or "medium" for artistic expression and the products of the camera as significant objects for art appreciation. Despite some in the profession with parochial attitudes on this question, most art educators seem to endorse the viewpoint that camera art is indeed a visual art form capable of inducing aesthetic response and usable in the classroom as an aesthetic end in itself. In any case, photographic visual statements in their variety of present day forms could become a far more substantial part of the elementary, secondary and higher curriculum than they are at this time. This can be done in at least two ways. First, the wealth of still and cinema film art already created could be studied in art appreciation or art history classes and even in the elementary curriculum. The roster of names of great film artists such as Weston, Adams, Flaherty, Eisenstien, Cartier-Bresson is large enough and their works are impressive enough both as human documents and as sources of visual aesthetic experience to make their neglect in our visual times an unfortunate spectacle.

Secondly, more than one experimental activity with even nursery age children indicates that the camera (both still and motion picture) can be used as an art studio device, providing some of the same opportunities for learning and individual expression as the more common brush and paint, clay, and other studio media. There is no need to conceive of photography as a replacement for painting or sculpture or printmaking, but rather it can be welcomed as an additional vehicle to promote whichever purposes are considered important to the art program.

This point of view is, of course, most congenial to the pupil, who is increasingly bombarded by vast numbers of photographic images from a variety of mass communications devices and, therefore, does not consider the photograph in the same unfavorable light in which he may well regard art; that is to say, feminine, abstruse, and capable of eliciting response only from the favored few. On the other hand, despite the considerable advances in camera engineering, the art teacher who uses the camera as an art tool does need to have more than a hobby level knowledge of the technical aspects of photography, particularly with respect to developing and printing techniques. To this end it is recommended that institutes or other training situations be organized through which art teachers can become technically adept in the production and assessment of still and motion picture photography. Here, the emphasis might well be on training groups of teachers representing varied teaching levels and portions of the country, so that they, in turn, can transfer the interest and some of the knowledge to others around them. Most particularly, those engaged in art teacher education might be heavily represented in training programs since they are in key positions with respect to influencing the interests of those who are to be art teachers in the coming years.

It might also be useful to develop a climate of interest in the photographic arts by reviewing films which are heavily committed to a visual art viewpoint in one or several of the professional journals of the field. In addition to reporting on films which deal with the teaching of art or with the visual arts alone, commercial cinema works such as the Japanese "Woman of the Dunes," Italy's "8½," or our own "Dr. Zhivago," might be reviewed in the light of their effective use in teaching as objects of art. In the era during which the term art has become elastic enough to admit forms such as "happenings," it is not at all far fetched to conceive of cinema as an appropriate vehicle with which to explore with young people the characteristics of aesthetic experience in visual terms.

Developing a single media system

Perhaps the most comprehensive and far-reaching recommendation of this report is the development of a single system of bringing visual and verbal data to the art classroom for group as well as individual instruction. In place of the battery of mechanisms now necessary to make full use of the potential of media for art teaching such as the tape recorder, record player, 16mm film projector, 8mm film projector, filmstrip projector, slide projector, overhead projector, TV receiver, teaching machines and, perhaps, others, one single system should be developed. This single system seems most appropriately related at this time to some type of computer, although further developments in technology may provide alternate storage sources.

While much computer-assisted learning research and development has been in the direction of auto-instructional systems, there is no necessity, technologically, for this restriction. Computer-assisted group instruction may well prove equally, if not more, desirable. What may be necessary and entirely feasible is a word and picture storage system with multiple retrieval facilities, so that the art teacher can bring both word and picture data to a class during group instruction as well as to be able to assign individual pupils to the same system for self-instruction.

To have access during a lecture or discussion to virtually instantaneous projection (or print-out) of words and images about any given subject in art stored in a computer would seem almost an ideal situation and yet is more than likely well within our present technological capability in more than one form. In order to teach post and lintel construction, for example, the art teacher would not have to select reproductions or diagrams (or make them himself) or project slides, transparencies or filmstrips, with all the attendant loss of time and pupil attention. The finest existing media units, both verbal and pictorial, could be stored in a computer or in some other fashion and presented on demand to a group of any size. One example of present technological advances in this direction is the reproduction of the Mona Lisa on the inside covers of this report. This version of Leonardo's masterpiece was produced as a digital plot by signals from a computer.

The specific questions to be answered in solving this problem have to do with present and potential systems for (a) word and picture storage or the form in which verbal and visual data can best be housed for rapid retrieval, (b) distance data transmission, or the means by which the words and pictures can be moved most quickly and with greatest fidelity from the storage source to the classroom, (c) classroom presentation or the devices best suited for displaying the images and words to groups and to individuals for self-instruction, to achieve desired educational goals, and (d) the verbal and pictorial content to be inserted in the storage system.

The question of content to be stored has to do with the selection of the areas of the visual arts (painting, sculpture, architecture, crafts, photography, etc.) to be represented, the paradigm monuments in each area or perhaps a wide range of exemplary monuments, and the verbal and pictorial data about each monument that must be stored.

Some of the difficulties of designing such a system are apparent at first glance. A modest extrapolation from present technology suggests a closed circuit television system connected by cable to a central, computer operated bank of tapes. The teacher's demand signal directs the computer to locate and engage the desired tape. Assuming color and increased fidelity, a film, filmstrip, series of slides, or any other visual capable of being placed on videotape and its accompanying sound can be brought to the classroom. But how large a number of art rooms can one storage system service? How short can the time between demand and projection be cut? How can the system handle a conflict of demands; that is, two art teachers calling for the same visual material at the same time? How large a storage capacity can be developed for one system? How costly would such a system be at the present time in comparison to the traditional multi-device procedure for projecting pictorial material?

Most of these, of course, are engineering problems and must be answered by technical people. The last question alone is one of social policy and can only be answered by those agencies of government on every level having the means to act on a positive decision. To be able to create such a system does not mean that it is worth creating, or, at least, more worthy of support than many other efforts. The materials presented in this report may suggest to the reader, as they do to this writer, that such a system is worth creating, for, until such time as some form of single system operation is developed, the impact of a great portion of the newer media as they exist today will not have been properly exploited by art education. For the teacher of art the greatest single boon that media can offer is unlimited access to visual images, a gift that science and technology may soon provide.

Appendices:

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The following list of published materials prepared with the assistance of the NEA Department of Audio-visual Instruction is designed to provide a list of basic reading in the media field.

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VISUALIZATION OF SOME RECOMMENDATIONS

1

Recognizing the photographic arts

School-age children on every level can use both still and motion picture photography as a medium for artistic expression and the products of the camera as significant objects for art appreciation. (Photos 1, 2, 3, 4)

2

3

Organizing a media center for the arts

The need for easily and quickly accessible media information can be met by developing a center with an appropriate data storage and retrieval system to which teachers of the arts can refer. (Photo 5)

Developing school facilities for media

The construction of effective physical facilities for media is essential for any thorough exploitation of the role of media in the teaching of art. (Photos 6, 7)

Expanding quantity and quality in media for art

Both commercial and non commercial sources will have to create a large reservoir of media units, well designed, up to date in educational theory and properly differentiated as to ages and background of pupil, from which the art teacher can make educationally defensible selections. (Photo 8)

Establishing interdisciplinary efforts

Both collective inquiry and communication between art educators and media people would be of mutual benefit. (Photo 9)

7

8

9

PHOTOS. 1, Vincent Lanier, NAEA; 2, 3, John Swayze, Project in Educational Communication, Columbia University; 4, Ansel Adams (slide by Sandak, Inc., New York City); 5, Joseph DiDio, NEA Photographic Department; 6, 7, NEA Photographic Department; 8, Book-of-the-Month Club; 9, Jack Hammond.

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